2022

Diabetes Self-Management Education for Nurses in the Primary Care Setting

Emilea Emade Mfortow
Walden University

Walden University

College of Nursing

This is to certify that the doctoral study by

Emilea Mfortow

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. Melissa Rouse, Committee Chairperson, Nursing Faculty
Dr. Maria Ojeda, Committee Member, Nursing Faculty
Dr. Jonas Nguh, University Reviewer, Nursing Faculty

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

Walden University
2022

Abstract

Diabetes Self-Management Education for Nurses in the Primary Care Setting

by

Emilea Emade Mfortow

MS, Walden University, 2014

BS, Brenau University, 2006

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

August 2022

Abstract

Diabetes is a chronic disease that can be controlled by self-management to reduce the risk of acute or long-term complications. Healthcare might encounter many challenges for patients' lack of adherence to diabetes self-management education. For this reason, lifestyle modification can be applied as a tool in the nursing field to manage adult patients with type 2 diabetes mellitus. This doctoral project addressed the gap in nursing practice for adult patients with type 2 diabetes regarding diabetes self-management education. This project focused on improving the nursing staff's knowledge to promote evidence-based diabetes self-management education with their patients. The goal was to educate the nurses, so they are prepared to teach type 2 diabetes patients about self-management to their patients by using the current guidelines. The module was built on the self-management and health promotion models as a framework for health promotion behaviors and effective interventions using the ADA guidelines for patients to engage in self-care. The nursing staff education program involved an educational module, resources, and a pre and post-knowledge survey. The findings revealed a gap in knowledge on diabetes self-management education for the nursing staff in primary care prior to the education. The overall scores for the pretest questionnaire with all seven participants were 84.3% and post-test 100%. This will better equip the staff to educate their patients leading to improved self-management of diabetes. This doctoral project has the potential for positive social change by improving staff knowledge, empowering patients with the knowledge to provide better self-care, and reducing the complications of type 2 diabetes mellitus.

Diabetes Self-Management Education for Nurses in the Primary Care Setting

by

Emilea Emade Mfortow

MS, Walden University, 2014

BS, Brenau University, 2006

Project Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Nursing Practice

Walden University

August 2022

Dedication

I dedicate this project and my academic achievements to God Almighty, creator, source of inspiration, knowledge, and understanding. I thank God for his blessings in my life and the ability to see through all my challenges. I am also dedicating this achievement to my wonderful husband Charles, and children Karl, Justice, Kevin, and Drusilla-Olga. I am honored to be a wife and mother. You all have encouraged and supported me to the highest peak of my career through this journey. Thank you all for your unconditional love, support, and encouragement. I love you all, and thank you all for believing in me. You all have inspired me to write this dedication to my adorable family. Thank you, and God bless you all. I am overjoyed to accomplish my goal through dedication and hard work, the Almighty God, and a good support system. In memory of my father, Hans Ebong Ngome, who instilled in me the beauty of education and learning. With God Almighty, anything is possible and will make way for you.

Acknowledgments

I want to seize this opportunity to extend my appreciation and thank all my committee chair members for the support and advice throughout this journey. Thank you all for your expertise and promptness in reviewing this doctoral project. I wish to give special thanks to my committee chair Dr. Melissa Rouse whose expertise, constructive review, advice, timely feedback, guidance, conference calls, and encouragement have inspired me to achieve my goals. I also want to acknowledge and give special thanks to Dr. Maria Ojeda and Dr. Jonas Nguh for serving on my committee and providing constructive feedback and contributions to completing my doctoral project. Lastly, I would like to thank the program coordinator, Dr. Joan Hahn, for her assistance and support.

Table of Contents

Section 1: Introduction....1
Introduction....1
Problem Statement....2
Purpose....4
Nature of the Doctoral Project....5
Significance....7
Summary....8
Section 2: Background and Context....9
Introduction....9
Concepts, Models, and Theories....9
The Self-Management Model....9
The Health Promotion Model (HPM)....10
Definition of Terms....12
Relevance to Nursing Practice....13
Local Background and Context....15
Role of the DNP Student....17
Role of the Project Team....18
Summary....19
Section 3: Collection and Analysis of Evidence....20
Introduction....20
Practice-Focused Question....20

Sources of Evidence 21
Diet 24
Physical Activity 24
Self-Monitoring of Blood Glucose 25
Blood Pressure Monitoring 26
Medication Adherence 26
Yearly Foot Examination 27
Eye Examination 27
Evidence Generated for the Doctoral Project 28
Participants 28
Procedures 28
Protections 30
Analysis and Synthesis 30
Summary 31
Section 4: Findings and Recommendations 32
Introduction 32
Findings and Implications 33
Pretest Questionnaire 33
Post-Test Questionnaire 34
Implications 35
Recommendations 37
Strengths and Limitations of the Project 37

Summary 38
Section 5: Dissemination Plan 39
Analysis of Self 39
Summary 40
References 42
Appendix A: Pretest Questionnaire 49
Appendix B: Posttest Questionnaire 51
Appendix C: Diabetes Self-Management Education 53

Section 1: Introduction

Introduction

Diabetes is a chronic metabolic condition associated with hyperglycemia, which is caused by partial or total insulin insufficiency (Egan & Dinneen, 2019). In the United States, 7.2 million people may be living with undiagnosed diabetes mellitus, and 23.1 million people have been diagnosed (Beck et al., 2017). Diabetes self-management education may reduce the risk of any acute or long-term complications (American Diabetes Association, 2019). Numerous difficulties may result from uncontrolled diabetes, including kidney failure, blindness, heart attack, stroke, hyperglycemia, hypoglycemia, and lower limb amputation (ADA, 2019). Individuals with type 2 diabetes may enhance their knowledge by using diabetes self-management education to improve compliance and health outcomes. Specific interventions are needed to improve outcomes for patients with type 2 diabetes. Diabetes self-management education interventions include modification of lifestyle, nutrition program, exercise program, blood glucose monitoring, and medication administration strategies (Gatlin et al., 2017).

The American Diabetes Association's Standard of Diabetes Medical Care (2019) recommends that all individuals with glycated hemoglobin A1c of 5.7-6.4% enroll in a program that supports target weight loss and an increase in physical activity. Despite the evidence that diabetes self-management education can improve health status and clinical outcomes, less than half of patients with type 2 diabetes receive formal diabetes education (Azam et al., 2017).

This doctoral project provided a primary care clinic in the Southeast United States with diabetes education for the nursing staff. The educational module equipped staff to educate adult patients with type 2 diabetes to improve quality of care and health outcomes. This is to encourage diabetes self-management education to help control hemoglobin A1c levels to less than 5.7% (Cunningham et al., 2018). If hemoglobin A1c is poorly controlled, it may result in microvascular and macrovascular complications (Cunningham et al., 2018). Patients with poor diabetes self-management education may not be able to manage their hemoglobin A1c levels. Diabetes self-management knowledge and skills are needed for patients to be able to perform self-care activities to manage their diabetes (Adjei Boakye et al.,2018). This project's objective was to develop a diabetes self-management educational module to educate the nursing staff in the primary care clinic. The educational module and resource prepared nursing staff to educate their diabetic patients about diabetes self-care management.

Problem Statement

Many challenges might be encountered by healthcare providers when taking care of patients with type 2 diabetes mellitus. Patients may be non-compliant to diabetes self-care management education, resulting in blindness, kidney failure, heart attack, stroke, and lower limb amputation (ADA, 2019). According to Funnell and Piatt (2017), diabetes self-management education and support are essential to enable people with diabetes to make decisions and assume responsibility for the day-to-day management of their disease. Type 2 diabetes is the seventh leading cause of death in the United States due to cardiovascular morbidity (World Health Organization, 2016).

This doctoral project provided nursing staff at a primary care clinic in the Southeast United States with diabetes education. The nursing staff consists of medical assistants (MAs), licensed practical nurses (LPNs), a registered nurse (RN), and a nurse practitioner (NP). I observed several trends at the primary care clinic that support the need for diabetes education. A gap in diabetes education was noted at the primary care practice when the providers and nurses did not use the recommended individualized treatment guidelines, which may affect patients' lifestyle with diabetes (ADA, 2019). There was a lack of ongoing diabetes education and follow-up appointments for patients after leaving the clinic. The nursing team acknowledged that some patients are unable to manage their own blood glucose levels and hypothesized it was due to a lack of staff training and thus ability to teach patients about diabetes self-management. The healthcare team voiced interest and readiness to participate in staff education to improve patient outcomes. I educated the nursing staff so they can teach adult patients with type 2 diabetes about self-care behaviors to manage their diabetes. Examples of positive lifestyle and self-care behaviors include maintaing a healthy diet and body weight, regular exercise, limited alcohol use, abstention from tobacco, using medication properly, daily monitoring of blood glucose level, regular doctor visits, and regular foot and eye exams (Felix et al., 2019). The educational program for staff incorporated various contributing factors for the management of type 2 diabetes. According to Funnell and Piatt (2017), including educational information on genetics, culture, sedentary lifestyle, environment, and socioeconomics can assist in improving the patients' health status, quality of life, and clinical outcomes. The doctoral project holds significance for the field of nursing practice

as it is to improve nurses'skills in delivering diabetes self-management education among type 2 diabetes mellitus patients by promoting evidence-based practice (EBP) and improving patient knowledge and skills to perform their self-care (Sugiharto et al., 2017).

Purpose

The gap in practice for this clinic was the lack of nursing staff training on diabetes self-management education. The purpose of this doctoral project was to develop an educational module and resource to educate the nursing staff about diabetes self-management education using current EBP guidelines. The goal was to improve staff knowledge about diabetes self-management education to help staff to be able to teach patients about diabetes self-management. This has the potential to improve the quality of care and outcomes for adult patients with type 2 diabetes.

This staff education doctoral project addressed the gap-in-practice by answering the practice-focused question:- Will education using the current evidence-based guidelines for type 2 diabetes self-management improve the staff's knowledge about type 2 diabetes mellitus self-care management? Adults with type 2 diabetes mellitus can manage their diabetes through routine exercise, blood glucose monitoring, weight control, diet, and medication adherence (ADA, 2019). Type 2 diabetes mellitus, a chronic disease, can be managed by involving family members and support groups that can encourage patients to continue with lifestyle changes (Beck et al., 2017). By teaching the nurses, they can then teach the patients so they can self-manage.

The nursing staff educational module includes topics such as lifestyle modification, nutrition programs, exercise programs, blood glucose monitoring,

medication administration strategies, and patient involvement with decision making (Gatlin et al., 2017). The staff will use the educational module to teach type 2 diabetes patients about self-management, including skills used in daily activities related to self-care (Palmer, 2017). This doctoral project addresses the gap in practice in that the nursing staff will be educated using the educational module to promote evidence-based diabetes self-management education among the patients.

Nature of the Doctoral Project

The approach that was used in this doctoral project was development of a nursing staff diabetes self-management education module. The staff consists of (MAs), (LPNs), an (RN), and a (NP). According to Wisse (2014), diabetes mellitus is a chronic disease that requires ongoing medical management. According to ADA (2019), diabetes self-management education for patients with type 2 diabetes mellitus requires constant training and support for nursing staff, diabetes care managers, practicing providers, and other caregivers.

Current literature and EBP guidelines by the American Diabetes Association (ADA) and Association of Diabetes Care and Education Specialist (ADCES) were used to develop a staff education module and patient education resource to increase staff knowledge about diabetes self-care management in an effort to equip nurses to be able to teach adult patients to manage their type 2 diabetes. The educational module includes handouts, guidelines, and a printed PowerPoint packet about current information on diabetes self-management education (Appendix D). The educational module increased the staff's knowledge to be able to teach type 2 diabetes patients about self-management,

including skills used in daily activities related to self-care (Palmer, 2017). The staff was invited to participate in the project and received pre and post-test questionnaires to assess their diabetes self-care management knowledge. The pretest and post-test assessments were in the form of a survey questionnaire based on 10 questions revised based on the Michigan Diabetes Research and Training Center's Revised Diabetes Knowledge Test (2016).

The questionnaire included diabetes self-management questions such as improving glucose control, physical exercise, meal plan, lifestyle modification, stress management, and social support. The survey consisted of questions to measure participants' knowledge regarding risk, benefits, and ways to improve glucose control in type 2 diabetes patients. Comparison of participants'answers before and after educational module presentation of diabetes self-care showed an improvement in knowledge

The project objective was to develop an educational module to educate the nursing staff about how to teach their adult patients with type 2 diabetes about self-care and how to manage their diabetes. A patient educational handout was created to be used as a resource by the nursing staff during patient educational encounters.

Prior to providing the education to participants, a panel of experts, including a primary care physician and the clinic administrator, reviewed the educational module and surveys related to diabetes self-management practices. The panel of experts reviewed the educational material specifically to ensure the accuracy and safety of the information being delivered. The experts completed a Likert-scale questionnaire rating the quality and

application of the program in the clinic setting. The module content was modified as needed based on the expert panel evaluation.

Significance

The stakeholders in the primary care setting include the physician, NP, RN, LPNs, and MAs. They acknowledged that some patients are unable to manage their own blood glucose levels and hypothesized it was due to a lack of staff training and thus patient teaching about diabetes self-management. Studies have shown that diabetes self-management education increases knowledge and understanding of the disease and its progression (Sugiharto et al., 2017). Training the nursing staff using current EBP guidelines about diabetes self-management and intervention will lead to better quality of care, improved health outcomes, and prevention of complications for patients with type 2 diabetes mellitus. According to Funnell and Piatt (2017), diabetes self-management education and support can be provided by family, friends, others with diabetes, peer mentors, community health workers, and healthcare team members. Based on the ADA's approved current guidelines, the educational module on diabetes self-management will positively impact the patients' health and reduce the financial burden of type 2 diabetes complications on the patients and their families (ADA, 2019). Research shows that diabetes self-management education has improved hemoglobin A1c and has clinical, behavioral, and psychosocial benefits for patients with type 2 diabetes (Powers et al., 2015). Diabetes self-management education can be used to manage and improve glucose control using non-pharmacological interventions, including weight management, meal planning, physical exercise, stress management, and family and social support.

This project applied the use of (EBP) guidelines by the ADA (2019). The doctoral project has potential implications for positive social change by reducing the complications of type 2 diabetes mellitus. This staff education DNP project will positively impact social change for nurses and patients at a primary care clinic by educating them about current diabetes self-care management guidelines. The nurses will have improved knowledge, and the patients will be educated about diabetes self-management. Diabetes self-management education will improve clinical outcomes, health status, and quality of life for type 2 diabetes patients. Together these will reduce the complications of type 2 diabetes.

Summary

The first section presents the DNP project on type 2 diabetes mellitus overview and related health issues from uncontrolled diabetes. Section 1 discussed the gap in clinical practice, project purpose, practice-focused question, nature of the project, and significance. For the next section, I will discuss both models and theories, including the project's background and context. I will also discuss relevance to nursing practice and my role as a DNP student.

Section 2: Background and Context

Introduction

The identified practice problem at this primary care clinic was the lack of nursing staff training on diabetes self-management education. The providers and nursing staff were not using the ADA's recommended treatment guidelines to help patients manage their diabetes. The purpose of this doctoral project was to provide education to the primary care setting nursing staff. Section 2 presents the self-management and health promotion models that will support diabetes self-management education for staff to use when teaching patients with type 2 diabetes mellitus. It presents a comprehensive review of the literature on diabetes self-care management and the application to nursing practice, the local background and context of the project, and my role as a DNP student and leader of the project team.

Concepts, Models, and Theories

Diabetes self-management education is a basic conceptual model incorporated by the ADA guidelines designed for type 2 diabetes patients to engage in self-care. The educational module was developed from two theories supporting diabetes self-management education: the self-management model and the health promotion model.

The Self-Management Model

This model is important for people with chronic diseases to control or reduce the disease impact by participating in self-care. The self-management model is more patient-centered with a theoretically based educational framework (Page-Reeves et al., 2017). According to Campbell et al. (2018), the self-management model outlines challenges that

patients might encounter in maintaining diabetes self-management practices. Patients with diabetes could address these barriers by adapting, simplifying, or personalizing the self-management approaches they have learned to successfully live with diabetes (Campbell et al., 2018). According to Page-Reeves et al. (2017), the self-management model is needed for patients to control their own diabetes with follow-up support to sustain self-management gains achieved during educational sessions. The self-management model also increases the quality of life and self-efficacy for patients with type 2 diabetes mellitus. The model could significantly improve diabetes outcomes for patients with type 2 diabetes mellitus.

The Health Promotion Model (HPM)

This model serves to provide an appropriate framework that helps guide researchers and health care professionals to intervene effectively (Rouholamini et al., 2020). This model was developed by Pender in 1982, where he provided a framework to examine influences in participating in health promotion behaviors and direction for effective interventions (Alkhalaileh et al., 2011). Pender's background was in nursing, human development, education, and social psychology. According to Pender,the health promotion model an individual's active role to achieve improved healthy states by interacting with interpersonal and physical environments. The HPM focuses on personal experiences and characteristics, specific feelings and cognitions of behaviors, and behavioral outcomes (Rouholamini et al., 2020). Furthermore, the HPM is used by type 2 diabetes patients to manage their illness due to health risks and complications. The HPM

was used for the nursing staff educational module for quality improvement. Pender's (2011) HPM focuses on the following major concepts:-

- Prior related behavior with same or similar behavior in the past,
- Biology, psychology, and sociocultural influences behavior such as age, personality structure, race, ethnicity, and socioeconomic status.
- The perceived benefit of the action: positive health behaviors, such as lifestyle modification,
- Perceived barriers to action: blocks, hurdles, and personal cost,
- Activity-related affect: positive and negative feelings,
- Interpersonal influences: family, providers, peers, beliefs, attitudes, social support, norms, role model, and expectation of significant others,
- Situation influences: personal perceptions, health-promoting behaviors, facilitators,
- Comment to a plan of action: identify specific strategies to maintain self-management needs,
- Immediate competing demands and preferences: alternative behaviors intrude into consciousness, such as work and family responsibility,
- Health-promoting behavior action-outcome: positive health outcome, healthy diet, exercising regularly, managing stress, and achieving optimal well-being.

The nursing staff were educated about the HPM to support the ability to teach their diabetes patient self-care management depending on the individual's current state of feeling well or feeling ill. The nursing staff were educated to encourage type 2 diabetes

patients to initiate health-promoting behaviors that are beneficial to reduce diabetes complications. Positive behaviors such as lifestyle modification with type 2 diabetes patients will reduce the risk of coronary heart disease, stroke, and peripheral vascular disease. Other health promotion behaviors will include blood glucose testing, foot care, a healthy diet, exercise, and medication-taking (Ammouri et al., 2018). The self-management model and HPM are essential for managing chronic diseases such as type 2 diabetes mellitus. Both models could be used to effectively manage diabetes based on patient participation and improved learning about type 2 diabetes mellitus. The above models were used to create the staff educational module and resource educate the nursing staff on diabetes.

Definition of Terms

Common terms to be clarified as used in the doctoral project are:

Diabetes self-management education (DSME): The ADA (2019) described DSME as an evidence-based standard and an ongoing process to improve the skills, knowledge, and ability to self-manage diabetes. The goal of DSME is active participation in disease management via education, active collaboration with health care personnel, and behavior modification (ADA, 2019).

Insulin: is a hormone produced by the pancreas responsible for regulating blood sugar to prevent hyperglycemia or hypoglycemia (ADA, 2019).

Self-management: is an ongoing process that facilitates the knowledge and skills necessary for diabetes self-care (Russell et al., 2017). Diabetes self-management activities include lifestyle modification, exercise, diet, daily blood sugar monitoring, and

medication adherence (ADA, 219). Russell et al. (2017) described self-management as patients with diabetes taking responsibility and caring for their own well-being and behaviors.

Type 2 diabetes mellitus: is a condition in which the body does not produce enough insulin or does not make use of the insulin secreted by the pancreas and results in a high level of blood glucose than normal (ADA, 2019).

Relevance to Nursing Practice

Type 2 diabetes mellitus is a problem that is global and significant. It is a condition with abnormal glucose in the blood. In patients with type 2 diabetes, the pancreas produces less insulin in the cells (ADA, 2019). Defronzo et al. (2015) described insulin resistance and impaired insulin secretion remain the core defects in type 2 diabetes mellitus. Impaired glucose homeostasis in type 2 diabetes may be caused by environmental factors, including obesity, unhealthy diet, physical inactivity, and genetic factors (Defronzo et al., 2015). Type 2 diabetes is a chronic disease that could be managed by self-care activities, which can reduce the risk of developing long-term complications. For example, acute and long-term complications may result in stroke, kidney failure, heart attack, and lower limb amputation (American Diabetes Association, 2019). Powers et al. (2017) addressed type 2 diabetes as controlled by self-monitoring of blood pressure and glucose, lifestyle changes, healthy eating, specialist visit, regular medical examinations, and medication adherence. According to the American College of Endocrinology (ACE) Guidelines, a target blood pressure goal of less than 120/80 mm Hg should be considered for some patients, provided it could be safely reached

(Handelsman et al., 2011). Self-monitoring of blood pressure could slow the progression of diabetes, nephropathy, and retinopathy. The ACE guidelines mention continuous self-glucose monitoring will improve hemoglobin A1c and reduce hypo and hyperglycemic alarms (Handelman et al., 2011). Lifestyle modification is encouraged for patients with type 2 diabetes, including a low sodium, low carbohydrate diet, weight loss for obese patients, physical exercise, and diabetic medication, including statin and angiotensin-converting enzyme inhibitors to slow the disease's progression (Handelman et al., 2011).

Diabetes self-management education will improve clinical outcomes and quality of life for patients with type 2 diabetes to provide knowledge and skills needed for self-care. Educating nursing staff about diabetes self-management in the primary care setting has been shown to improve their ability to teach, thus improving patients' skills and knowledge to self-manage their chronic disease and to improve health outcomes. Diabetes self-management education guidelines are recommended by the ADA for the treatment of type 2 diabetes mellitus. Power et al. (2017) described diabetes self-management as a foundation that helps patients with diabetes make health decisions and perform activities that could improve their health outcomes. The strategies to deliver diabetes self-management education to address the gap in practice are transferring knowledge in decision making, self-care behavior, and problem-solving to improving clinical outcomes, health status, and quality of life (Sugiharto et al., 2017). Current evidence-based guidelines by the ADAwill be incorporated into the educational module.

In this project, the aim was to advance nursing practice to address the gap in education about diabetes self-management, which was lacking for nursing staff in the

primary care setting. The nursing staff and providers were not using appropriate ADA guidelines for patients with type 2 diabetes. In addition, the patients diagnosed with diabetes were not provided with the proper information or follow-up care regarding diabetes self-management education.

This doctoral project provided nursing staff with an educational module and patient resources needed to improve compliance with diabetes self-management education in the primary care setting for type 2 diabetes patients. This project improved nurses' knowledge in delivering diabetes self-management education to patients with type 2 diabetes (Sugiharto et al., 2017). Also, educating the nursing staff about diabetes self-management education will likely improve the practice compliance on diabetes self-management and health outcomes. This project contributes to nursing practice by enhancing knowledge in the field of nursing.

Local Background and Context

Diabetes is the third leading cause of death after heart disease and cancer in the United States of America (ADA, 2019). Diabetes self-management education is needed for these patients to manage their condition. Type 2 diabetes mellitus will lead to complications including blindness, stroke, heart disease, kidney failure, and lower limb amputation (ADA, 2019). About 50 % of the patients who receive care at the primary care clinic in the Southeast United States are diabetic and hypertensive. The primary care clinic located in southeast United States manages patients with chronic conditions, such as diabetes, hypertension, asthma, and heart diseases. The clinic manages about 250 diabetes patients in 1month. There are five examination rooms, two triage rooms, a

laboratory room, and a reception area. The clinic has four offices that include one for medical records, two for the providers, and one for the nursing staff. The clinic also sees patients in the community with mental health disorders like depression, anxiety, and acute conditions such as common cold, rash, and minor injuries. The doctoral project site's mission and strategic vision is to provide quality health care for patients in the communities that are affordable based on the patient's beliefs, needs, and values. The clinic has about 700 patients with 400 adult patients with type 2 diabetes, mostly African Americans and Hispanics.

The primary care clinic staff is comprised of one NP, one RN, two LPNs, and three MAs. The providers and nurses at the primary care setting were not utilizing the recommended individualized treatment guidelines by the ADA for diabetes self-management education. They also lacked ongoing diabetes education and follow-up evaluation of patients after leaving the clinic. The nursing team acknowledged that some patients are unable to manage their own blood glucose levels and hypothesized it was due to lack of staff training and thus patient teaching about diabetes self-management education. The project's goal was to educate staff at the clinic on diabetes self-management education strategies to improve and facilitate patients'engagement in self-management interventions. The aim was to improve patient self-care to manage their chronic health condition.

For this DNP staff education project, the educational module and patient resource about diabetes self-management were presented to seven staff members. The education program included PowerPoint handouts and open discussions with the project goal to

improve staff knowledge about diabetes self-management education to help them to be able to teach patients about diabetes self-management. A patient resource guide was created that the staff can use when doing patient teaching.

Role of the DNP Student

I am currently an advanced practice registered nurse pursuing a DNP degree. A doctoral project was initiated as part of the curriculum to facilitate a nursing practice change in the primary care clinic. As a DNP student, I identified an issue occurring in the clinical practice setting and provided evidence-based education content using the current guidelines. I used quality improvement as one of the learning objectives that could be implemented in the practicum environment using the DNP Essential VI, which consists of Interprofessional Collaboration for Improving Patient and Population Health outcomes through staff education, effective communication, and collaborative skills (AACN, 2006).

I observed a high prevalence of type 2 diabetes among adult patients. As a result, I created an educational program that concentrated on diabetes self-management education through health teaching focused on lifestyle modification, including a low sodium, low-fat diet, and low carbohydrate diet, weight loss for obese patients, physical exercise, and medication adherence. The results of the project were analyzed and presented to the clinic leadership and staff. Thus, as a DNP student, I have acquired adequate skills, knowledge, and training to provide evidence-based education to promote change in the health care environment.

My motivation for this doctoral project is my experience working in a primary care setting. Most adult patients are not aware they have diabetes. As the leader of the project, my responsibility was to review articles with evidenced-based guidelines about diabetes self-management and to develop the educational module that will be used to train the staff. I presented the information individually as a printed PowerPoint packet. This helped the staff identify strategies that improved their diabetes self-management interventions to help manage their chronic disease. Educating the staff about diabetes self-management education allows them to be able to help the patients understand and improve self-care with more involvement in their daily activities required for managing their chronic conditions (Stenberg et al., 2018). There were no biases that affected the project outcome because I am not related to any staff or patients at the clinic.

Role of the Project Team

The project team consisted of multiple stakeholders who offered input based on their expertise and evidence-based practice. The primary care physician who is an expert in diabetes management will take ultimate responsibility for ensuring the accuracy of the content of the educational program. The expert panel was made up of a primary care physician (MD) and the clinic administrator. The medical doctor, who is the primary care physician at the clinic, has been managing patients with chronic diseases, including type 2 diabetes, for thirty years. The clinic administrator has been managing the clinic for almost ten years. The panel reviewed the educational module and pre and post-education surveys. They completed a Likert-scale questionnaire rating the program quality and

application in the clinic setting. The module content was modified as needed based on the expert panel evaluation.

Summary

The second section presented the DNP overview. I discussed the gap in clinical practice, summarized both models and theories, including the project's background and context, relevance to nursing practice, and my role as a DNP student. The role of the project team was addressed. For the next section, I will discuss the practice-focused question and evidence sources, including the plan for analysis and synthesis of project data.

Section 3: Collection and Analysis of Evidence

Introduction

Type 2 diabetes is a chronic disease that can be managed to prevent health complications such as blindness, kidney failure, heart attack, stroke, and limb amputation (ADA, 2019). The healthcare providers might encounter challenges when taking care of patients with type 2 diabetes. Some of the challenges observed in the clinic were patient's lack of adherence or non-compliance to diabetes self-care management education. The nursing staff at the primary care clinic lack training on diabetes self-management education.

The purpose of this doctoral project was to educate the staff at the primary care clinic about diabetes self-management education using an educational module. The goal was to improve their knowledge to be able to teach patients about diabetes self-management. This will improve patient compliance with diabetes self-care management for adult patients with type 2 diabetes. This will also improve the quality of care and patient outcomes. The third section comprises the practice-focused question, sources of evidence, analysis and synthesis of findings, and summary.

Practice-Focused Question

In a primary care clinic in the Southeast United States, I observed a gap in diabetes self-management education when the providers and nurses did not use the recommended individualized ADA treatment guidelines, which may affect type 2 diabetes patients' lifestyles. The gap in practice for this clinic was the lack of staff training on diabetes self-management education. My goal for the doctoral project was to

bridge the gap in the primary care clinic by developing an educational module and patient resource to educate the staff about diabetes self-management education using current evidence-based guidelines and to increase staff knowledge about type 2 diabetes. This will assist them in helping teach patients to self-manage their diabetes. This doctoral project addresses the gap-in-practice by answering the practice-focused questionP:- Will staff education using the current evidence-based guidelines by the ADA for type 2 diabetes self-management improve knowledge about type 2 diabetes mellitus self-care management?

Sources of Evidence

I perfomed a literature search using search engines to locate information related to diabetes self-management education and the design of the educational module. The following databases were used for information on diabetes self-management education to create the educational module: MEDLINE with Full Text, ProQuest Nursing & Allied Health Source, Cumulative Index to Nursing, and Allied Health Literature (CINAHL), Cochrane Database of systematic reviews, Ovid Nursing Journals, Database of Abstracts of Reviews of Effects (DARE).

To acquire detailed literature about nursing staff education on diabetes self-management education, the keywords used for the literature search included: diabetes-self-management education, diabetes-self-management programs, evidence-based practice guidelines, type 2 diabetes management, a sedentary lifestyle, self-management intervention, health promotion model, diabetes self-management intervention, challenges

of managing type 2 diabetes, stages of change model, and diabetes self-management guidelines.

The scope of this review in terms of years searched and types of literature and sources searched involves conducting a detailed search in these databases. These search database specifications contained peer-reviewed journals, systemic reviews, summaries of evidence, evidence-based articles, clinical research, journals, best practices, reviews of scholarly published within 5 years, and information about type 2 diabetes and diabetes self-management education. Diabetes self-management education guidelines by the ADA have been the most proven evidence-based treatment strategies that will facilitate quality care, promote health, and prevent complications if practiced as recommended for adult patients with type 2 Diabetes Mellitus (ADA, 2019). According to Powers et al. (2015), implementation of this nursing staff educational module using the ADA and American Association of Diabetes Educators (AADE) will have a positive outcome on the health of the patients with type 2 diabetes and reduce the economic burden for type 2 diabetes mellitus complications.

In addition, another source of evidence to address the practice-focused question is a literature review from the ADA for type 2 diabetes mellitus, and diabetes self-management education guidelines in a primary care setting will form the foundation of my educational module (ADA, 2019). According to the World Health Organization (2016), type 2 diabetes is the most common type of diabetes and a major cause of heart disease, stroke, kidney failure, blindness, and lower limb amputation. The pertinent information on diabetes self-management education formed the educational module that

will be used to educate the nursing staff on teaching type 2 diabetes patients how to self-manage their chronic condition. A diabetes self-management education program is required to regulate daily activities for patients with type 2 diabetes mellitus (Beck et al., 2017).

Diabetes self-management education strategies will empower patients with type 2 diabetes to control their condition with knowledge, skills, and confidence (Alhashemi et al., 2021). Diabetes self-management education may also reduce the number and duration of hospitalizations, improve glycemic control, health outcomes, and quality of life, and alleviate the economic and financial burden of the disease (Alhashemi et al., 2021).

The current state of the nursing practice problem has been mentioned in various scholarly works. However, patients with type 2 diabetes should rely on lifestyle changes that are more effective in treating and preventing complications of diabetes (ADA, 2019). As a result of this, researchers recommended that diabetes self-management education improves patient health conditions and outcomes compared to medication alone (Chrvala et al., 2016). Furthermore, increased interaction and educational intervention between patients with type 2 diabetes and their primary care nurses have improved diabetes self-management and health outcomes (Messina et al., 2017). The following interventions for diabetes self-management were presented in the education and included diet, physical activity, self-glucose monitoring, blood pressure monitoring, medication adherence, doctors visit, foot care, and eye care (ADA, 2019).

Diet

Healthy eating is one of the self-management behaviors for people with type 2 diabetes mellitus. According to ADCES (2020), healthy eating for patients with diabetes contains a variety of vegetables, fruits, whole grains, dairy, lean sources of protein, and oil low, while keeping salt, added sugars, saturated and trans fats to a minimum. As a result, this diet improves weight loss and hemoglobin A1c. It also improves cardiovascular risk factors in type 2 diabetes (Breukelman et al., 2021).

Physical Activity

Living with type 2 diabetes and being active is more important for staying healthy (ADCES, 2020). Aerobic exercise is recommended for patients with type 2 diabetes mellitus. Type 2 diabetes patients should begin physical activities slowly and build up gradually. Physical activities can help patients with type diabetes lose body fat, get more fit, boost muscle strength and aerobic endurance, lower blood glucose, enhance mood, improve blood pressure and cholesterol, feel less stressed or anxious, and reduce the chances of dying early (ADCES, 2020). Furthermore, patients on insulin therapy should be educated on the side effects of exercise on blood glucose level and how to adjust insulin intake and food before, during, and after exercise to prevent hypo and hyperglycemia. Type 2 diabetes patients should engage in physical activity like walking at least 30 minutes a day five times a week to lower the blood glucose level, improve insulin sensitivity, decrease medication need, reduce body fat, improve cardiovascular benefits, and stress reduction (Breukelman et al., 2021).

Self-Monitoring of Blood Glucose

Monitoring of blood glucose is an important aspect of self-care (ADCES, 2020). It helps the patient know if they are meeting recommended treatment goals to keep healthy. Using a self-monitoring blood glucose meter will improve glycemic control and reduce the risk of diabetes complications for patients with type 2 diabetes mellitus (Powers et al., 2017). For example, patients who are on an oral hypoglycemic agent, insulin injection, and insulin pump therapy should assess their blood glucose using self-monitoring or continuous blood glucose monitoring before meals and at bedtime (Chamberlain et al., 2019). Type 2 diabetes patients should also monitor their blood glucose before exercising or treating a hypoglycemic episode until they are normoglycemic. The normal blood glucose level for type 2 diabetes patients is 80 to 120 mg/dL (ADA, 2019). Hypoglycemia is blood glucose < 70 mg/dL and should be treated with rapidly absorbed glucose orally if the patient is responsive and able to swallow (Handelman et al., 2015). If a patient cannot swallow or is unresponsive, intramuscular glucagon should be given by a trained family member, or medical personnel. Signs and symptoms of hypoglycemia include anxiety, tremors, palpitations, hunger, sweating, behavior changes, cognitive dysfunction, seizures, and coma (Handelman et al., 2015). Type 2 diabetes patients should be educated about signs of hyperglycemia which is defined as blood glucose above 180 mg/dL. Symptoms of hyperglycemia include frequent urination, increased thirst, blurred vision, fatigue, headache, dry mouth, shortness of breath, nausea and vomiting, confusion, abdominal pain, and coma (Handelman et al., 2015). Hyperglycemia can be controlled by taking medication as

prescribed, proper nutrition, and exercise. Emergency care is needed if symptoms worsen.

Blood Pressure Monitoring

The target blood pressure reading for patients with type 2 diabetes should be < 140/90 mmHg per current guidelines by the ADA (ADA, 2019). Type 2 diabetes patients diagnosed with Hypertension may benefit from self-monitoring their blood pressure daily five times a week (Timpel et al., 2020). Other factors that will benefit type 2 diabetes patients to lower their blood pressure will be physical activities at least three times a week for 30 minutes, compliance with antihypertensive medication, reduced sodium intake, and a low-fat diet. Furthermore, a therapeutic lifestyle for hypertensive patients will include interventions that emphasize reduced salt intake, such as the DASH diet (Dietary Approaches to Stop Hypertension). This diet will help lower blood pressure for patients with type 2 diabetes mellitus (Handelman et al., 2015). Lowering blood will reduce the risks of diabetes, nephropathy, and retinopathy (Powers et al., 2017).

Medication Adherence

Taking medications helps lower the risk for heart attack, stroke, and kidney damage by managing blood glucose, blood pressure, and cholesterol levels for patients with type 2 diabetes (ADCES, 2020). Furthermore, medication adherence for patients with type 2 diabetes may include keeping a list of current medication, filling a prescription, taking medication at the right time, safely disposing of needles, and sharing medication beliefs and concerns (ADCES, 2020).

Regular Doctor Visits

Diabetes patients are encouraged to have routine quarterly visits to check for hemoglobin A1c. Hemoglobin A1c levels of less than 5.7% have been linked to a better outcome. Type 2 diabetes patients should see this doctor at least every 3 to 6 months (Gopalan et al., 2020). Type 2 diabetes patients are recommended to do annual checks for lipid profile, microalbuminuria, serum creatinine, body mass index, and to have foot and eye examinations (ADA, 2019).

Yearly Foot Examination

Annual foot examinations are recommended for type 2 diabetes patients to monitor foot ulcers, which could lead to non-traumatic foot or lower limb amputation. Type 2 diabetes patients are encouraged to regularly do their own self-foot examination to check for foot ulceration and decreased sensation which could be related to diabetes neuropathy (ADA, 2019). In addition, type 2 diabetes patients are encouraged to wear diabetic shoes that fit comfortably to prevent blisters, bunions, and calluses (ADA, 2019). Patients with type 2 diabetes are encouraged to look closely at the tops and bottoms of their feet every day. They should look for redness, cuts, bruises, sores and use a mirror if needed (ADCES, 2020). Don't go barefoot. Patients are encouraged to keep their feet clean and dry and to walk barefoot. If they found a problem with their feet, they should call their provider immediately (ADCES, 2020).

Eye Examination

The recommendation by the ADA for eye examination for patients with type 2 diabetes should receive a dilated retinal examination by an ophthalmologist at diagnosis

(ADA, 2019). A yearly diabetes eye examination could limit potential vision loss from diabetes retinopathy (Paksin-Hall et al., 2013).

Researchers have considered evidence-based findings to significantly improve patients' compliance with diabetes self-management education in the primary care setting. By educating nurses so they are better able to teach their patients, diabetic patient outcomes can be improved. Diabetes self-management education will provide patients with type 2 diabetes the knowledge and skills to perform self-care behaviors, manage crises and lifestyle changes (Kumah et al., 2021).

Evidence Generated for the Doctoral Project

Participants

The participants of this DNP staff education project included one RN, two LPNs, one NP, and three MAs working at the clinic. Current literature and EBP guidelines from the ADA were used to develop a staff education module and patient education resource to increase staff knowledge about diabetes self-care management education. This equips nurses to be able to teach adult patients to manage their type 2 diabetes. The medical staff, which includes the MAs can emphasize interventions that can be made by the nursing educators to assist type 2 diabetes patients with regards to self-management of their condition.

Procedures

Class participants received a module that consisted of a self-paced presentation including handouts, guidelines, and a printed PowerPoint packet about current information on diabetes self-management education. The module took about 45 minutes

to complete. The staff who participated in the education received pre and post-test questionnaires to assess their diabetes self-care management knowledge. The project used test questions related to diabetes knowledge for staff education pretest (Appendix A) and post-test (Appendix B) to assess their knowledge about diabetes self-care before and after receiving the educational packet and resource. The pretest and post-test consisted of 10 multiple choice questions related to the management of patients with type 2 diabetes mellitus (Michigan Diabetes Research and Training Centers, 2016). The participants were asked to use a unique identifier for the pretest and to use the same one for the post-test to measure for improvement in knowledge. After the staff educational module presentation, the participants were given a post-test survey to evaluate what they can remember about diabetes self-care management. The survey included diabetes self-management questions about improving glucose control, physical exercise, meal planning, lifestyle modification, stress management, and social support. A comparison of participants' pre-education and post-education scores on the questionnaire was used to determine if there was an improvement in knowledge. The goal was that their knowledge would improve after the educational module self-paced presentation.

Prior to providing the education to participants, a panel of experts, including a primary care physician and the clinic administrator, reviewed the educational module and surveys. The panel of experts that have been managing chronic illnesses such as type 2 diabetes mellitus will complete a likert-scale questionnaire to ensure the appropriateness and accuracy of the content. The module and pre and post-test survey content were

modified as needed based on the expert panel evaluation. After the expert panel review and program modifications, the staff were asked to participate in the education program.

Protections

All participant information was kept confidential. Those staff members who participated received a consent form for anonymous questionnaires before initiating the module survey questions. The consent form stated that participation is voluntary and confidential. Each participant was asked to create a unique identifier to be used on their pre and post-test.

There were no ethical issues that hindered the completion of this project. Throughout the project, the information provided remained confidential. The participants were informed of human subjects' protection, that their information and identity was kept private. All data was kept on a password-protected computer accessible only to the DNP student.

I obtained the Walden University Institutional Review Board (IRB) approval before conducting the project. The signed site agreement form for approval was submitted with the Walden IRB application. This project follows the guidelines based on the Walden University DNP manual on staff education
(2019).

Analysis and Synthesis

A likert-scale questionnaire was used by the expert panel to evaluate the appropriateness and accuracy of the content a pre and post-surveys. Revisions were made based on their feedback. A pre and post-test was used to evaluate the nursing staff

knowledge before and after the educational module. The questions are displayed in Appendices A and B. The pretest assessed nursing staff knowledge on diabetes self-management education. The post-test was administered to assess their improvement in knowledge on diabetes self-management education.

Descriptive statistics, including percentages, mode, mean, and standard deviation, were used to compare the pretest and post-test scores for the participants. The percentage scores determined if the was an improvement in knowledge on diabetes self-management education.

Summary

In section 3, the purpose of the DNP project and the practice focused question were described. Sources of evidence were discussed and support this important topic. Participants, procedures, and protections were assessed. The pre and post-test questionnaires will be used to validate if there is an improvement in staff knowledge about diabetes self-care management education. Section 4 discusses the introduction, findings and implications, recommendations, team contribution, and strength and limitation of the project.

Section 4: Findings and Recommendations

Introduction

This DNP project was designed to bridge the nursing practice gap related to diabetes self-management education for staff at primary care clinic in the Southeast United States. The nature of the project was a nursing staff educational program about diabetes self-management education to help improve their knowledge to be able to teach patients about diabetes self-management. This doctoral project addressed the gap-in-practice by answering the practice-focused question: Will staff education using the current evidence-based guidelines by the ADA for type 2 diabetes self-management improve knowledge about type 2 diabetes mellitus self-care management? The purpose of the doctoral project was to develop an educational module and resource to educate the nursing staff about diabetes self-management education using current EBP guidelines. The sources of evidence used to address the practiced-focused question were through a comprehensive literature review. These sources were obtained from journal articles, clinical research, current evidence-based guidelines related to diabetes self-management education for adult patients with type 2 diabetes, and staff education on diabetes self-care management. Based on the evidence obtained, I developed an educational module and patient resources, which consisted of a self-paced presentation including handouts, guidelines, and a printed PowerPoint packet about current information on diabetes self-management education. The staff knowledge was evaluated and analyzed related to the project's practice-focused question. The pre and post-education scores on the questionnaire were compared and shows improvement in knowledge. The fourth section

comprises the findings and implications, recommendations, and summarizes the project's key points, strengths, and limitations.

Findings and Implications

The staff who participated received a pretest questionnaire to assess their diabetes self-care management knowledge of the ADA and AADE current guidelines and questions related to the management of patients with type 2 diabetes. The pretest questionnaire (Appendix A) included questions related to the management of patients with type 2 diabetes mellitus by the ADA and AADE guidelines for diabetes self-management recognition (Questions 1- 4) complications of type 2 diabetes mellitus (Questions 5-7), and patient education and self-management (Questions 8 -10). There were seven participants (N=7) who answered the pretest questionnaire. The pretest questionnaire revealed that the staff had an insufficient baseline knowledge about diabetes self-management education. These questions revealed a knowledge gap in ADA and AADE guidelines for diabetes self-management recognition (Questions 1-4), complications of type 2 diabetes mellitus (Questions 5-7), and patient education and self-management (Questions 8-10).

Pretest Questionnaire

There were seven participants who answered the pretest questionnaire 1-10, which was multiple choice to circle one correct answer. Results for the pretest were: For Question 1, 60% chose the correct answer for the diabetic diet. For Question 2, 40% chose the correct answer for the highest food item in carbohydrates. On Question 3, 70% of the participants chose the correct answer for blood glucose testing. For Question 4,

70% chose the correct answer for glycosylated hemoglobin. On Question 5, 60% of the participants chose the correct answer which was that eating food lower in fat decreases the risk of heart disease.

Furthermore, for Question 6, 70% of the participants chose the correct answer on which organ is not associated with diabetes. For Question 7, 80% of the participants chose the correct answer that numbness and tingling sensation may be symptoms of nerve disease for patients with type 2 diabetes. For Question 8, 60% of the participants chose the correct answer, that patients realize just before lunch that they forgot to take their insulin at breakfast should check their blood glucose level to decide how much insulin to take. For Question 9, 40% of the participants chose the correct answer for the effect exercise has on blood glucose. On Question 10, 40% chose the correct answer and the best way to take care of diabetic feet. The overall scores for the pretest questionnaire with all seven participants were 84.3% which revealed a knowledge gap in diabetes self-management education.

Post-Test Questionnaire

After the nursing staff took the pretest questionnaire, the educational module consisting of a self-paced presentation including handouts, guidelines, and a printed PowerPoint packet about current information on diabetes self-management education was handed out. It took about 45 minutes to complete. After the educational module self-paced presentation, a post-test questionnaire was given to the nursing staff to assess their diabetes self-care management knowledge. The post-test questionnaire had the same questions as the pretest questionnaire. For all the post-test questions, 100% of the

participants chose the correct answers for Questions 1-10. In addition, 100% of the participants believed that the educational modules and resources improved their diabetes self-care management knowledge. The staff is ready to use the revised questions on the Michigan Diabetes Research and Training Centers to screen patients. The results of the pretest questionnaire indicated that the staff who participated lacked knowledge of diabetes self-management education related to ADA guidelines before the staff education program. The post-test questionnaire revealed that the staff had increased knowledge of diabetes self-care management education to be able to teach their patients about diabetes self-care. This answered the practice-focused question for this project.

Implications

Results from this project reveal that the staff educational modules and resources had positive impact on knowledge for the nursing staff. This module has improved the nursing staff's knowledge and understanding of diabetes self-management education guidelines by the ADA when attending and overseeing patients with type 2 diabetes mellitus. The important implication that follows the educational module and resources for the nursing staff was their intent to utilize the revised questions on the Michigan Diabetes Research and Training Centers. This motivates the nurses, especially when educating their diabetes patients and assisting them to self-manage their disease to prevent complications associated with type 2 diabetes mellitus. These educational modules also help the nursing staff enhance the quality of life for adult patients diagnosed with type 2 diabetes and those at risk in their communities. Patients with type 2 diabetes mellitus then are proactive and equipped to manage their condition by instituting lifestyle

modifications, including nutrition, blood glucose monitoring, exercise, medication adherence, eye exams, and routine foot care that will improve their health. In addition, many of these interventions have been shown to be cost-effective for patients with type 2 diabetes (Powers et al., 2017). This positive implication will also lead to health care cost reduction and improved well-being of the patients with type 2 diabetes (ADA, 2019). With the improvement with nursing staff knowledge and implicated diabetes self-management education guidelines, an effort is made to bridge the gap in practice for nurses to educate adult patients with type 2 diabetes which is the aim of this project.

The lack of nursing staff knowledge on diabetes self-management education was observed with the pretest questionnaire results. Potential implications are the need for primary care clinics to provide staff education to help teach their patients self-care by utilizing EBP guidelines. This educational module and resources for diabetes self-management education were beneficial implications used in my institution. My primary care clinic adopted my educational module and resources and implemented its principles with other related health modules. The healthcare system benefits from the educational module and resources by effectively addressing and finding solutions to close the gap in nursing practice for diabetes self-management education for adult patients with type 2 diabetes mellitus. The results of the DNP project contribute to positive social change as nurses' knowledge about diabetes self-management education increases and they incorporate current evidence-based guideline strategies into their plan of care at the clinic. The results also contribute positive social change to promote awareness for adult

patients with type 2 diabetes to improve their quality of life and health outcomes using evidence-based diabetes self-management education (ADA, 2019).

Recommendations

I created an educational module and resources on diabetes self-management using the current ADA guidelines and presented it to the clinic nursing staff in response to the gap in practice observed at the primary care clinic in the Southeast United States. The panel of experts recommended implementing the educational module and resources at the primary care clinic. Another recommendation was for clinic administration to implement policies that include continuing nursing staff education for diabetes self-management education using current evidence-based guidelines by the ADA. The clinic administration could also improve the clinic practice by encouraging other DNP research projects to provide nursing staff with current evidence-based guidelines to improve patient quality of life and outcomes. Finally, I recommend the nursing staff to continue encouraging social support through friends, family, and community to promote healthy outcomes for adult patients with type 2 diabetes mellitus. These recommendations are beneficial in addressing the gap in practice on diabetes self-management education for patients with type 2 diabetes.

Strengths and Limitations of the Project

The strength of this DNP project was the support by the panel of experts, who offered approval of the nursing staff educational module and resources at the primary care clinic. An added strength to this project was the use of pretest and post-test questionnaires to analyze the nursing staff's knowledge on diabetes self-management

education. Another strength of the project was having nursing staff with different backgrounds, LPN, RN, NP, and MA who participated in the educational module to improve the quality of care and outcomes for patients with type 2 diabetes mellitus. Lastly, another added strength to this project was the willingness of the nursing staff to participate in the educational program to learn and understand diabetes self-care with the utilization of current EBP guidelines by the ADA.

There were various limitations attributed to this project. One of the limitations was the lack of continuous follow-up with the nursing staff to determine the project's long-term outcome. The project was also limited by small sample size of participants, based on the small at the clinic, which may have created a bias. Even though the project was done in a primary care clinic, the small sample size limits the results from being incorporated into other settings.

Summary

The goal of this project was to develop a diabetes self-management educational module and resources to educate the nursing staff in the primary care clinic for them to educate their diabetic patients about diabetes self-care. The project reveals that the educational module and resources on current evidence-based guidelines improved the staff's knowledge on diabetes self-management education. In Section 5, I will describe project dissemination and my role as a DNP student.

Section 5: Dissemination Plan

The project result dissemination is important because it contributes to nursing and increases the knowledge that many could use and apply. The dissemination of results occurred at the primary care clinic. Therefore, the primary care clinic could benefit from the results of the educational modules and resources. This could also help those in others facilities facing a similar lack of nursing staff knowledge on diabetes self-management education for adult patients with type 2 diabetes mellitus. Job training and staff in-services using this diabetes self-management education are recommend for those that identify a need. The DNP project could be disseminated along with other online resources such as the ADA and ADCES that other healthcare systems can use. Finally, the publication of the project would also disseminate knowledge. In addition, the results of the study can be presented by the DNP student via poster at the national conference of the American Association of Nurse Practitioners (AANP).

Analysis of Self

My DNP project has allowed me to develop my research and knowledge skills. I created educational modules and resources to improve staff knowledge on diabetes self-care management education. As a DNP student, I have improved as a scholar by using my knowledge and skills to bring positive change into the healthcare system while delivering quality care that meets practice standards. In addition, I had the opportunity to address the practice knowledge gap problem by educating the nursing staff. As a DNP scholar, this project increased my knowledge and professional skills to be able to teach the nursing staff about diabetes self-care management education guidelines as stipulated

by the ADA and ADCES. As a practitioner, I had the privilege of teaching the nursing staff to educate their patients on self-care management. As a project manager, I will use my leadership skills to bring positive change in the community and the nursing profession that meet practice standards. This project has increased my knowledge and nursing professional skills as a scholar. My DNP project has improved my knowledge and strength to use EBP to deliver safe and quality care and improve patient outcomes. The DNP learning process and skills are defined in The Essentials of Doctoral Education for Advanced Nursing Practice (American Association of Colleges of Nursing, 2006). The project aims were achieved, and I plan to focus on improving the quality of care, promoting health, and preventing complications through staff education opportunities. I used my skills to face certain challenges and become an effective leader in bringing positive change to the healthcare system by improving the quality of care to patients, families, and the community. I will continue to consult with the clinic staff on current EBP guidelines on training materials related to primary care.

Summary

In conclusion, the project goals and outcome were successfully met. The project was accomplished by implementing an educational module and resources for the nursing staff about EBP guidelines regarding diabetes self-management. This project was to improve the knowledge gap of the nursing staff to educate their diabetic patients about diabetes self-care management. With the use of the current evidence-based guidelines by the ADA and ADCES, the goal of the nursing staff knowledge was improved and ultimately achieved. Therefore, the project has the potential to improve the quality of care

and outcomes for patients with type 2 diabetes mellitus. In addition, this doctoral project improved the nurse's skills in delivering diabetes self-management education among type 2 diabetes patients by promoting EBP in the primary care setting to improve patients' knowledge and skills to perform self-care.

References

ADCES 2020 Research Abstracts...Association of Diabetes Care & Education Specialists, Annual Virtual Conference, 17-18 September, 2020. (2020). *Diabetes Educator*, *46*(4), 398–406. https://doi.org/10.1177/0145721720932682

Adjei Boakye, E., Varble, A., Rojek, R., Peavler, O., Trainer, A. K., Osazuwa-Peters, N., & Hinyard, L. (2018). Sociodemographic factors associated with engagement in diabetes self-management education among people with diabetes in the United States. *Public Health Reports*, *133*(6), 685-691.

Alhashemi, M., Alduwaisan, H., & Al-Hilal, M. (2021). The effect of structured diabetes self-management education on type 2 diabetes patients attending a Primary Health Center in Kuwait. *Diabetes Research and Clinical Practice*, *171*.

Alkhalaileh, M. A., Khaled, M. H. B., Baker, O. G., & Bond, E. A. (2011). Pender's health promotion model: An integrative literature review. *Middle East Journal of Nursing*, *5*(5), 12–22.

American Association of Colleges of Nursing. (2006). The essentials of doctoral education for advanced nursing practice. http://www.aacn.nche.edu/dnp/Essentials.pdf

American Diabetes Association. (2018). 2. Classification and diagnosis of diabetes: standards of medical care in diabetes—2018. *Diabetes care*, *41*(Supplement 1), S13-S27. https://doi.org/10.2337/dc18-S002

American Diabetes Association. (2019). Standards of medical care in diabetes—

2019. *Diabetes care*, *37*(Supplement 1), S13-S28. www.diabetes.org/diabetescare

Ammouri, A. A., Abu Raddaha, A. H., Natarajan, J., & D'Souza, M. S. (2018). Perceptions of risk of coronary heart disease among people living with type 2 diabetes mellitus. *International Journal of Nursing Practice (John Wiley & Sons, Inc.)*, *24*(1), 1.

Azam, L., Meurer, J., Nelson, D., Asan, O., Flynn, K., Knudson, P., & Young, S. (2018). Cultural and social challenges of diabetes self-management education through physicians'voices. *WMJ: Official Publication of the State Medical Society of Wisconsin*, *117*(5), 219-223.

Beck, J., Greenwood, D. A., Blanton, L., Bollinger, S. T., Butcher, M. K., Condon, J. E., & Kolb, L. E. (2018). 2017 National standards for diabetes self-management education and support. *The Diabetes Educator*, *44*(1), 35-50.

Breukelman, G. J., Basson, A. K., Djarova, T. G., Du Preez, C. J., Shaw, I., Malan, H., & Shaw, B. S. (2021). Concurrent low-carbohydrate, high-fat diet with/without physical activity does not improve glycaemic control in type 2 diabetics. *South African Journal of Clinical Nutrition*, *34*(1), 18–21.

Campbell, F., Lawton, J., Rankin, D., Clowes, M., Coates, E., Heller, S., ... & Breckenridge, J. P. (2018). Follow-Up Support for Effective type 1 Diabetes self-management (The FUSED Model): A systematic review and meta-ethnography of the barriers, facilitators and recommendations for sustaining self-management skills after attending a structured education programme. *BMC*

Health Services Research, *18*(1), 1-24.

Center for Disease and Prevention. (2017*). National diabetes statistics report, 2017: Estimates of Diabetes and its burden in the United States.* Retrieved from https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf

Chamberlain, J. J., Doyle-Delgado, K., Peterson, L., & Skolnik, N. (2019). Diabetes Technology: Review of the 2019 American Diabetes Association Standards of Medical Care in Diabetes. *Annals of Internal Medicine*, *171*(6), 415–420.

Chrvala, C. A., Sherr, D., & Lipman, R. D. (2016). Diabetes self-management education for adults with type 2 diabetes mellitus: A systematic review of the effect on glycemic control. *Patient Education and Counseling*, *99*(6), 926–943.

Cunningham, A. T., Crittendon, D. R., White, N., Mills, G. D., Diaz, V., & LaNoue, M. D. (2018). The effect of diabetes self-management education on HbA1c and quality of life in African-Americans: A systematic review and meta-analysis. *BMC health services research*, *18*(1), 367.

DeFronzo, R. A., Ferrannini, E., Groop, L., Henry, R. R., Herman, W. H., Holst, J. J., ... & Weiss, R. (2015). Type 2 diabetes mellitus. *Nature reviews Disease primers*, *1*(1), 1-22.

Egan, A. M., & Dinneen, S. F. (2014). What is Diabetes?*Medicine*, *42*(12), 679-681.

Felix, H. C., Narcisse, M.-R., Long, C. R., English, E., Haggard-Duff, L., Purvis, R. S., & McElfish, P. A. (2019). The Effect of Family Diabetes Self-management Education on Self-care Behaviors of Marshallese Adults with Type 2

Diabetes. *American Journal of Health Behavior*, *43*(3), 490–497.

Funnell, M. M., & Piatt, G. A. (2017). Incorporating Diabetes Self-management Education Into Your Practice: When, What, and How. *The Journal for Nurse Practitioners*, *13*(7), 468–474.

Gatlin, T. K., Serafica, R., & Johnson, M. (2017). Systematic review of peer education intervention programs among individuals with type 2 diabetes. *Journal of Clinical Nursing,* 26, 23-24

Gopalan, A., Suttner, L., Troxel, A. B., McDonough, K., & Schapira, M. M. (2020). Testing patient-informed approaches for visually depicting the hemoglobin A1c value to patients with poorly controlled diabetes: a randomized, controlled trial. *BMC Health Services Research*, *20*(1), 178.

Handelsman, Y., Mechanick, J. I., Blonde, L., Grunberger, G., Bloomgarden, Z. T., Bray, G. A., ... & Wyne, K. L. (2011). American Association of Clinical Endocrinologists Medical Guidelines for clinical practice for developing a diabetes mellitus comprehensive care plan: executive summary. *Endocrine practice*, *17*(2), 287-302.

Handelsman, Y., Bloomgarden, Z. T., Grunberger, G., Umpierrez, G., Zimmerman, R. S., Bailey, T. S., Blonde, L., Bray, G. A., Cohen, A. J., Dagogo-Jack, S., Davidson, J. A., Einhorn, D., Ganda, O. P., Garber, A. J., Garvey, W. T., Henry, R. R., Hirsch, I. B., Horton, E. S., Hurley, D. L., … Zangeneh, F. (2015). American Association of Clinical Endocrinologists and American College of Endocrinology – Clinical Practice Guidelines for Developing A Diabetes

Mellitus Comprehensive Care Plan – 2015 — Executive Summary. *Endocrine Practice*, *21*(4), 413–437.

Kumah, E., Afriyie, E. K., Abuosi, A. A., Ankomah, S. E., Fusheini, A., & Otchere, G. (2021). Influence of the Model of Care on the Outcomes of Diabetes Self-Management Education Program: A Scoping Review. *Journal of Diabetes Research*, 1–12.

Learning about Diabetes, Inc. (2006). Retrieved from www.learningaboutdiabetes.org

Messina, J., Campbell, S., Morris, R., Eyles, E., & Sanders, C. (2017). A narrative systematic review of factors affecting diabetes prevention in primary care settings. *PLoS One*, *12*(5), e0177699.

Michigan Diabetes Research Training Center (MDRTC). (1998). *Diabetes knowledge test (DKT).* Retrieved from http://www.med.umich.edu/mdrtc/profs/surveysurvey.html.

Nepper, M. J., McAtee, J. R., Wheeler, L., & Chai, W. (2019). Mobile Phone Text Message Intervention on Diabetes Self-Care Activities, Cardiovascular Disease Risk Awareness, and Food Choices among Type 2 Diabetes Patients. *Nutrients*, *11*(6).

Page-Reeves, J., Regino, L., Murray-Krezan, C., Bleecker, M., Erhardt, E., Burge, M., Bearer, E., & Mishra, S. (2017). A comparative effectiveness study of two culturally competent models of diabetes self-management programming for Latinos from low-income households. *BMC Endocrine Disorders*, *17*(1), 46.

Paksin-Hall, A., Dent, M. L., Dong, F., & Ablah, E. (2013). Factors Contributing to

Diabetes Patients Not Receiving Annual Dilated Eye Examinations†. *Ophthalmic Epidemiology*, *20*(5), 281–287.

Palmer, C. (2017). Providing self-management education to patients with type 2 diabetes mellitus: Addressing basic nutrition and hypoglycemia. *The Nurse Practitioner*, *42*(11), 36-42.

Polit, D. F., & Beck, C. T. (2017). *Nursing research: Generating and assessing evidence for nursing practice*. Lippincott Williams & Wilkins.

Powers, M. A., Bardsley, J., Cypress, M., Duker, P., Funnell, M. M., Fischl, A. H., ... & Vivian, E. (2017). Diabetes self-management education and support in type 2 diabetes: a joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. *The Diabetes Educator*, *43*(1), 40-53.

Rouholamini, S., Gheibizadeh, M., Maraghi, E., & Jahanshahi, A. (2020). The effects of a training program based on the health promotion model on physical activity in women with type 2 diabetes: A randomized controlled clinical trial. *Iranian journal of nursing and midwifery research*, *25*(3), 224.

Russell, N. M., Vess, J., Durham, C., & Johnson, E. (2017). Text-Messaging to Support Diabetes Self-Management in a Rural Health Clinic: A Quality Improvement Project. *Online Journal of Nursing Informatics*, *21*(2), 9–1.

Smith, N. M. (2016). Pediatric Diabetes Telemedicine Program Improves Access to Care for Rural Families: Role of APRNs. *Pediatric Nursing*, *42*(6), 294–299.

Stenberg, U., Vågan, A., Flink, M., Lynggaard, V., Fredriksen, K., Westermann, K. F., &

Gallefoss, F. (2018). Health economic evaluations of patient education interventions a scoping review of the literature. *Patient Education and Counseling*, *101*(6), 1006–1035. https://doi-

Sugiharto, S., Stephenson, M., Hsu, Y.-Y., & Fajriyah, N. N. (2017). Diabetes self-management education training for community health center nurses in Indonesia: a best practice implementation project. *JBI Database of Systematic Reviews and Implementation Reports*, *15*(9), 2390–2397.

Timpel, P., Oswald, S., Schwarz, P. E. H., & Harst, L. (2020). Mapping the evidence on the Effectiveness of Telemedicine Interventions in Diabetes, Dyslipidemia, and Hypertension: An Umbrella Review of Systematic Reviews and Meta-Analyses. *Journal of Medical Internet Research*, *22*(3), e16791.

Walden University (2019). *Manual for staff education Doctor of Nursing Practice (DNP) scholarly project*. Walden University.

World Health Organization. (2016). *Global report on diabetes*. http://apps.who.int/iris/bitstream/handle/10665/204871/9789241565257_eng.pdf?sequence=1

Appendix A: Pretest Questionnaire

This set of questions relates to the management of patients with type 2 diabetes mellitus.

Please circle only one correct answer for each question.

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

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

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

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

5. Eating foods lower in fat decreases risk for:
   a. Nerve disease
   b. Kidney disease
   c. Heart disease
   d. Eye disease

6. Which of the following is usually <u>not</u> associated with diabetes:
   a. Vision problems
   b. Kidney problems
   c. Nerve problems
   d. Lung problems

7. Numbness and tingling may be symptoms of:
    a. Kidney disease
    b. Nerve disease
    c. Eye disease
    d. Liver disease

8. A patient realizes just before lunch that they forgot to take their insulin at breakfast. What should they do?
    a. Skip lunch to lower blood glucose
    b. Take the insulin that is usually taken at breakfast
    c. Take twice as much insulin as usually taken at breakfast
    d. Check blood glucose level to decide how much insulin to take

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

10. The best way to take care of diabetic feet is to:
    a. Look at and wash them each day
    b. Massage them with alcohol each day
    c. Soak them for 1 hour each day
    d. Buy shoes a size larger than usual

Michigan Diabetes Research and Training Center's Revised Diabetes Knowledge Test (2016).

Appendix B: Posttest Questionnaire

This set of questions relates to the management of patients with type 2 diabetes mellitus. After receiving the diabetes educational program, please circle only one correct answer for each question.

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

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

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

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

5. Eating food lower in fat decreases your risk for:
   a. Nerve disease
   b. Kidney disease
   c. Heart disease
   d. Eye disease
6. which of the following is usually <u>not</u> associated with diabetes:
   a. Vision problems
   b. Kidney problems
   c. Nerve problems
   d. Lung problems

7. Numbness and tingling may be symptoms of:
    a. Kidney disease
    b. Nerve disease
    c. Eye disease
    d. Liver disease

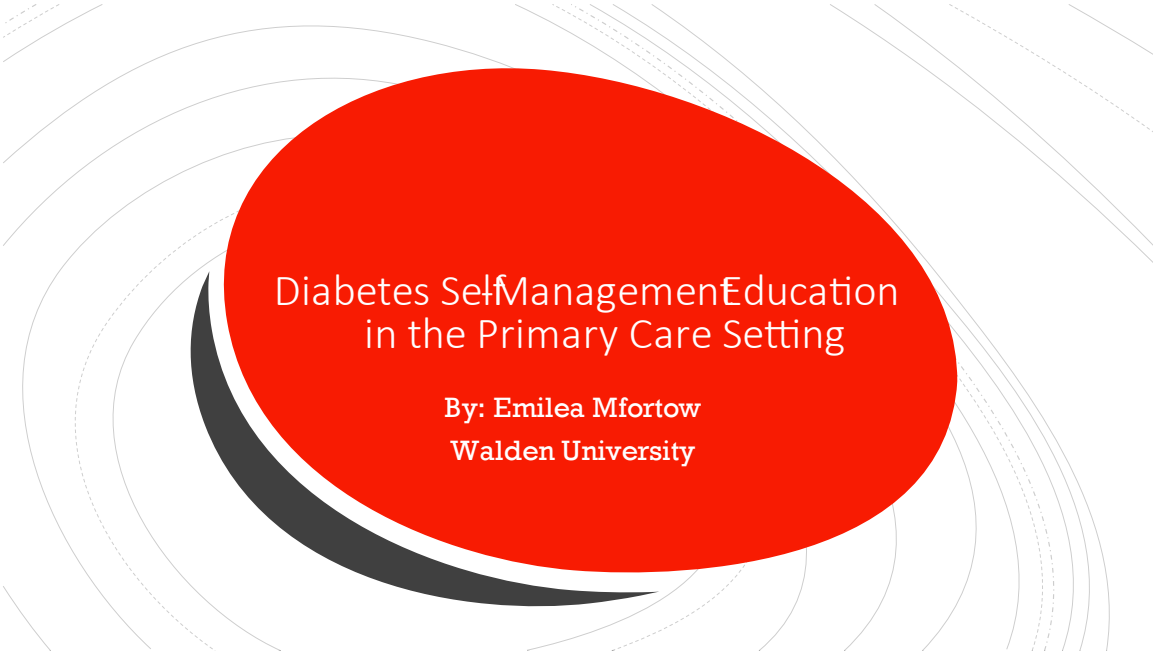
8. A patient realizes just before lunch that they forgot to take their insulin at breakfast. What should they do now?
    a. Skip lunch to lower blood glucose
    b. Take the insulin that they usually take at breakfast
    c. Take twice as much insulin as they usually take at breakfast
    d. Check blood glucose level to decide how much insulin to take

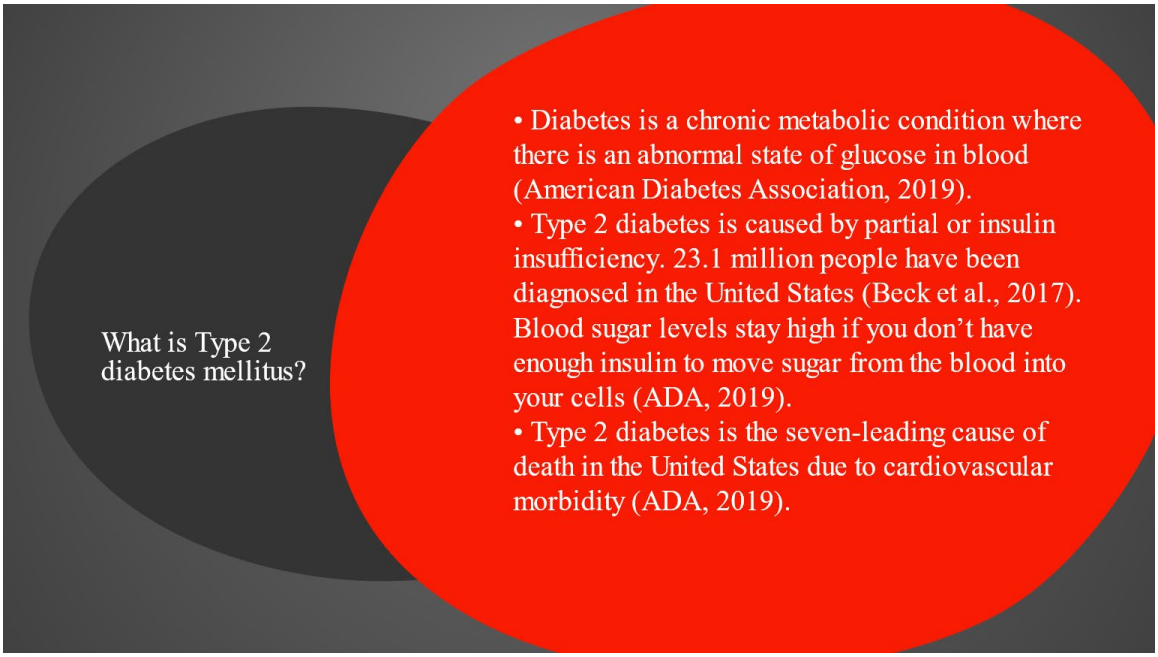
9. For a person in good control, what effect does exercise have on blood glucose?
    a. Lower it
    b. Raises it
    c. Has no effect

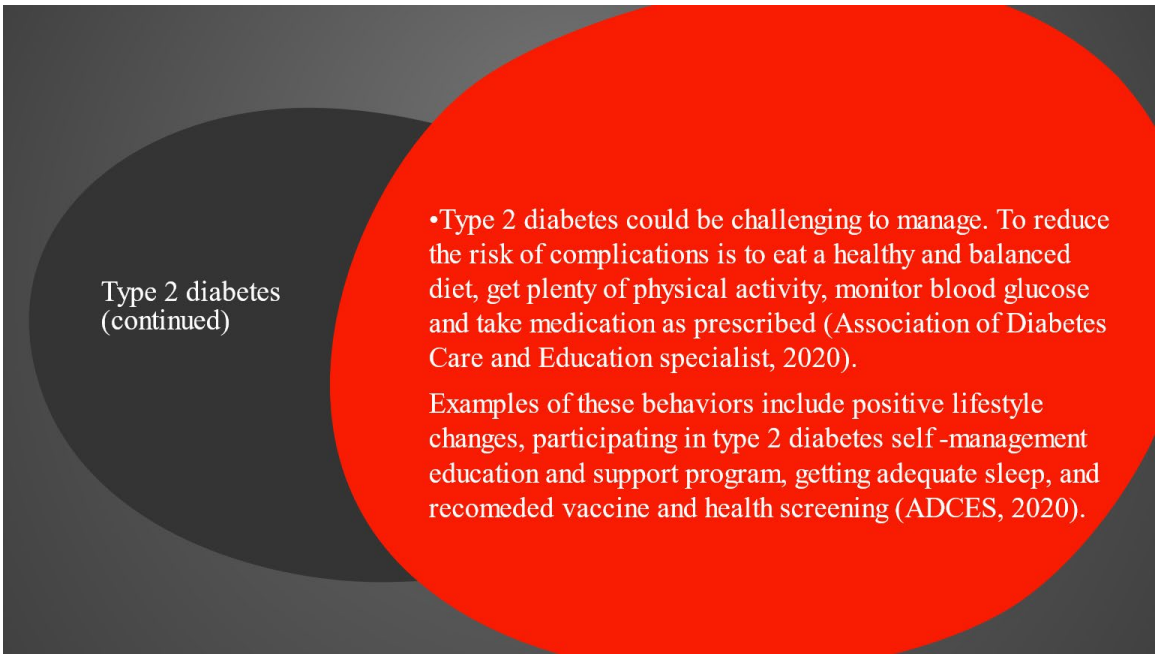
10. The best way to take care of diabetic feet is to:
    a. Look at and wash them each day
    b. Massage them with alcohol each day
    c. Soak them for one hour each day
    d. Buy shoe size larger than usual

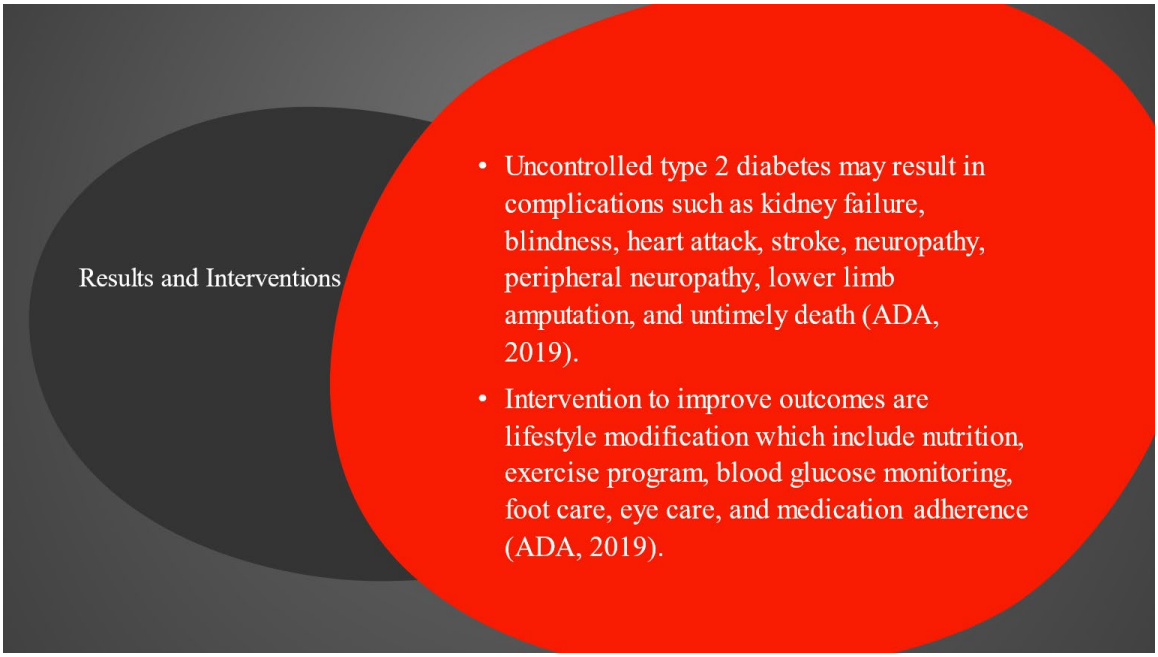
Michigan Diabetes Research and Training Center's Revised Diabetes Knowledge Test (2016)

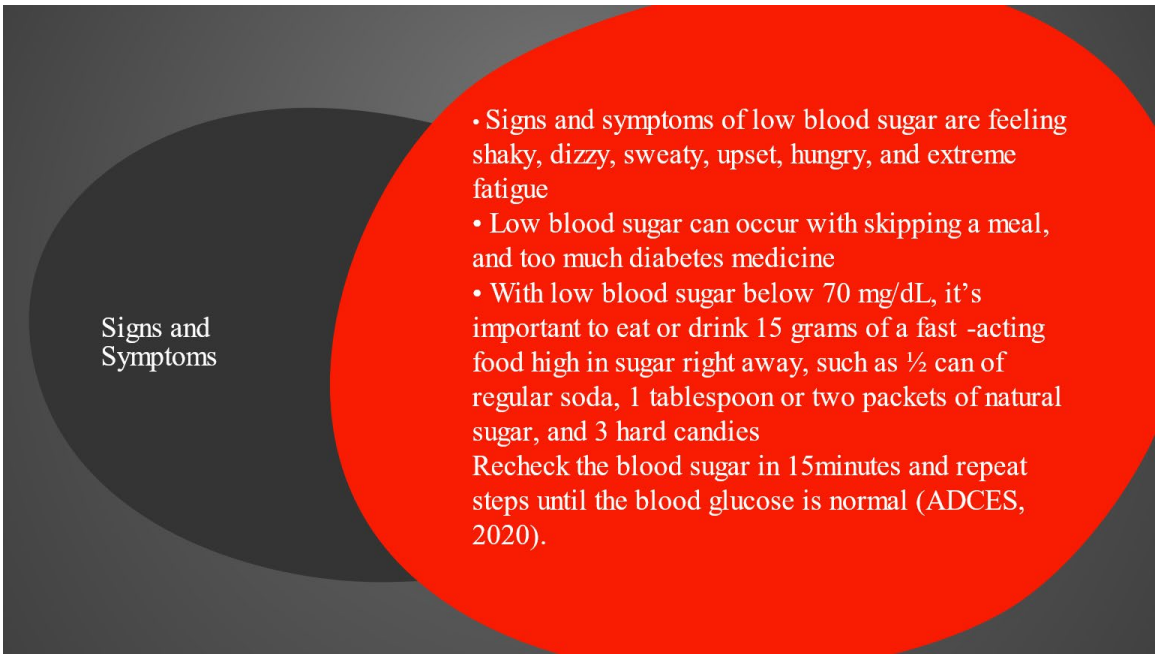
Appendix C: Diabetes Self-Management Education

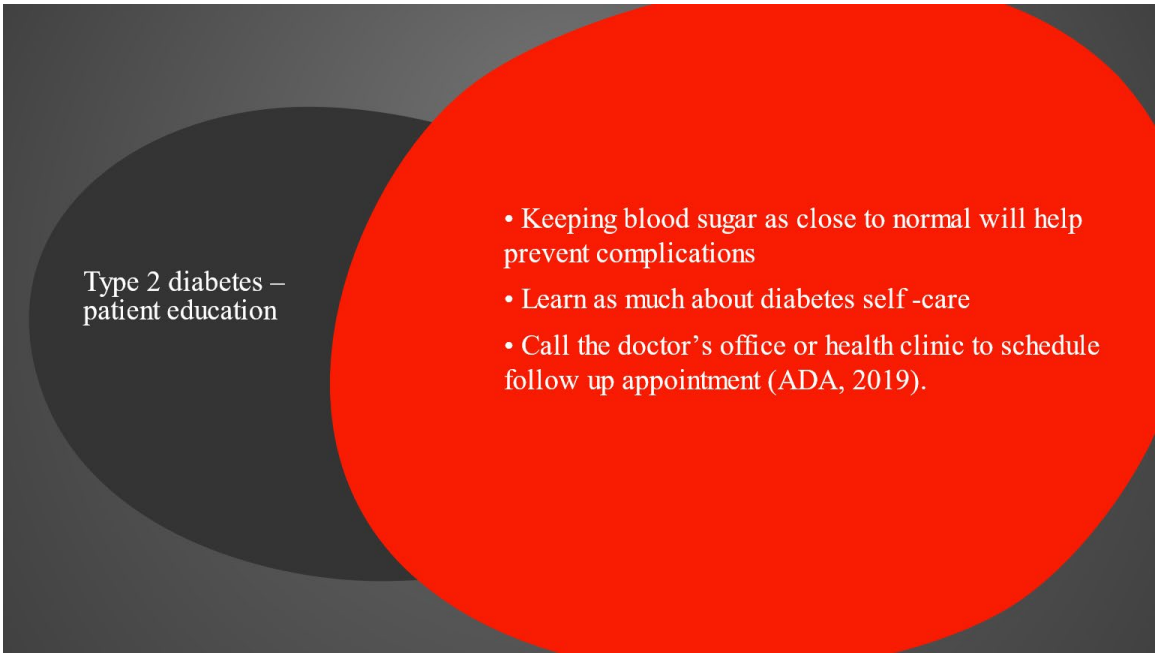


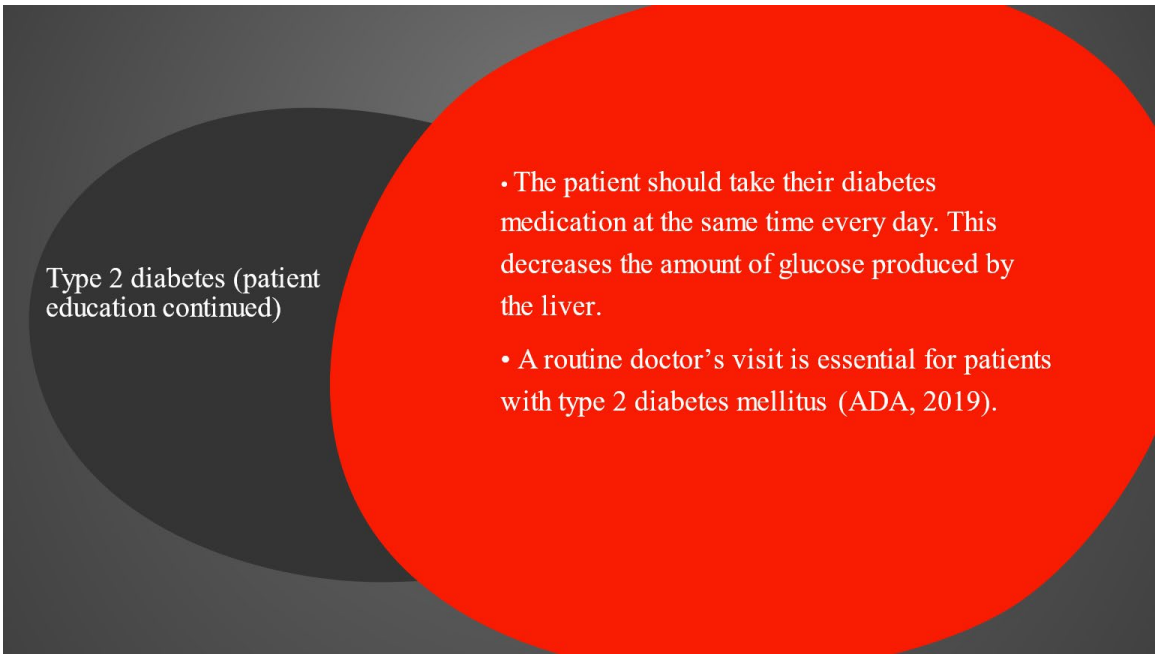


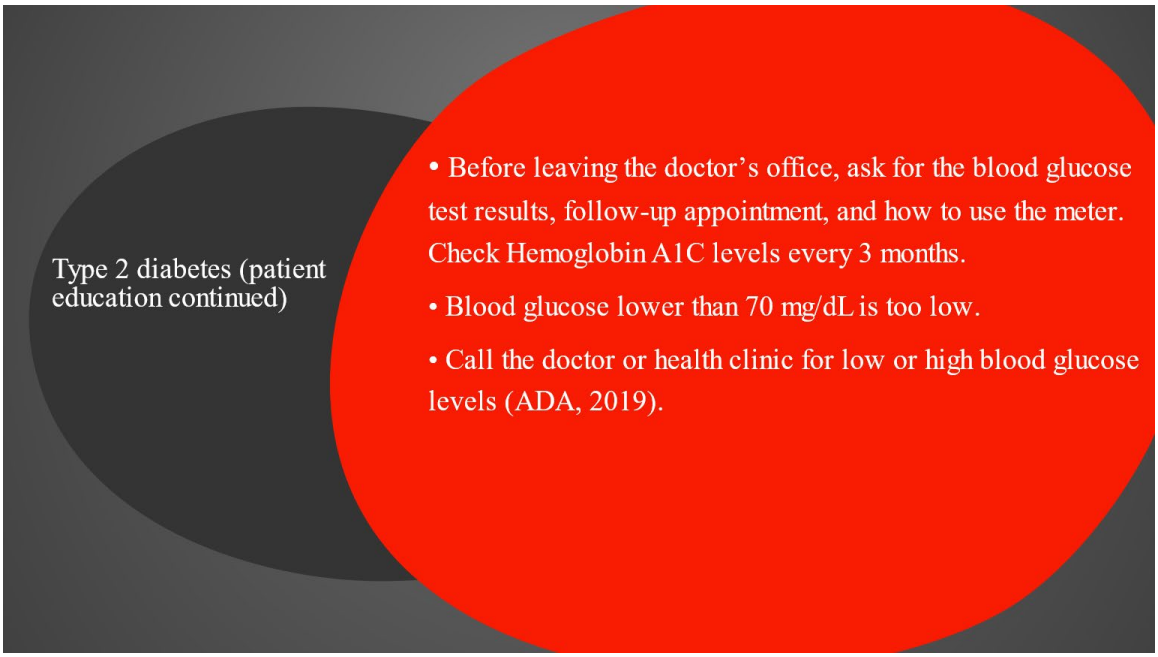

Type 2 diabetes (continued)
•Type 2 diabetes could be challenging to manage. To reduce the risk of complications is to eat a healthy and balanced diet, get plenty of physical activity, monitor blood glucose and take medication as prescribed (Association of Diabetes Care and Education specialist, 2020).
Examples of these behaviors include positive lifestyle changes, participating in type 2 diabetes self-management education and support program, getting adequate sleep, and recomeded vaccine and health screening (ADCES, 2020).

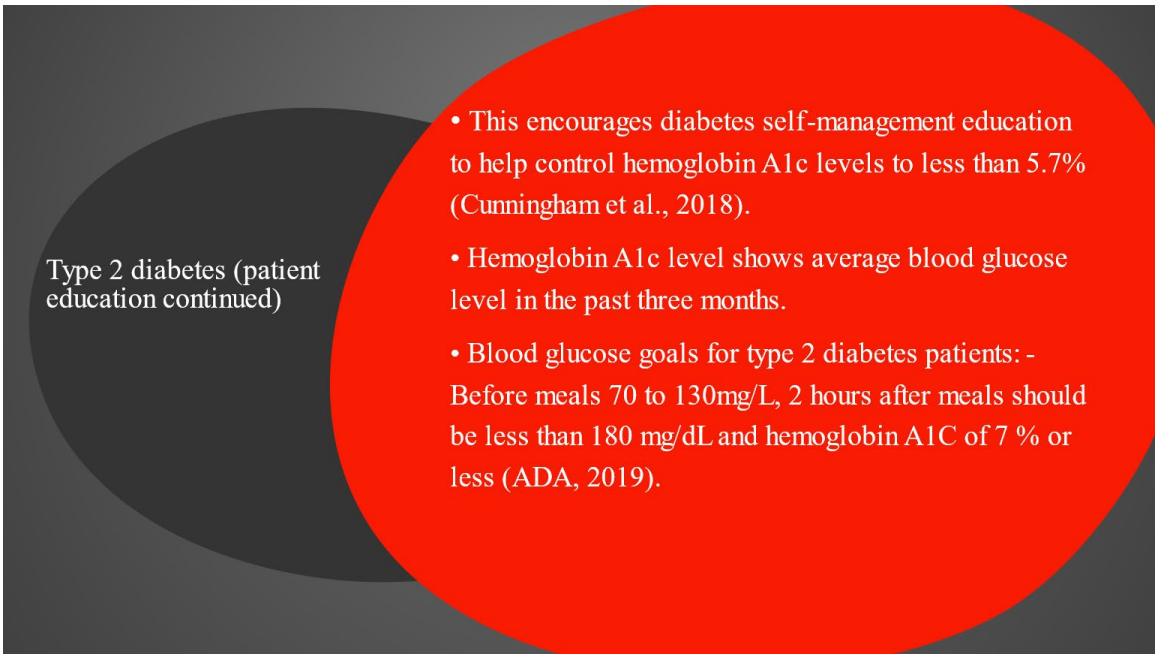

Results and Interventions
• Uncontrolled type 2 diabetes may result in complications such as kidney failure, blindness, heart attack, stroke, neuropathy, peripheral neuropathy, lower limb amputation, and untimely death (ADA, 2019).
• Intervention to improve outcomes are lifestyle modification which include nutrition, exercise program, blood glucose monitoring, foot care, eye care, and medication adherence (ADA, 2019).

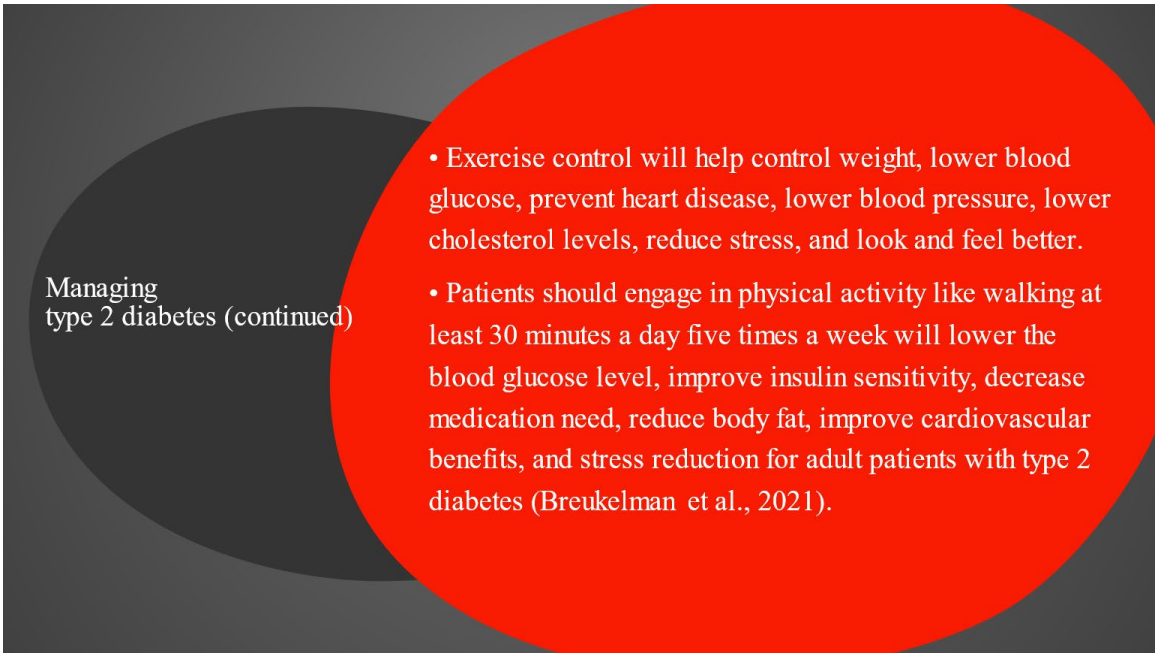

Signs and Symptoms
• Signs and symptoms of low blood sugar are feeling shaky, dizzy, sweaty, upset, hungry, and extreme fatigue
• Low blood sugar can occur with skipping a meal, and too much diabetes medicine
• With low blood sugar below 70 mg/dL, it's important to eat or drink 15 grams of a fast -acting food high in sugar right away, such as ½ can of regular soda, 1 tablespoon or two packets of natural sugar, and 3 hard candies
Recheck the blood sugar in 15minutes and repeat steps until the blood glucose is normal (ADCES, 2020).

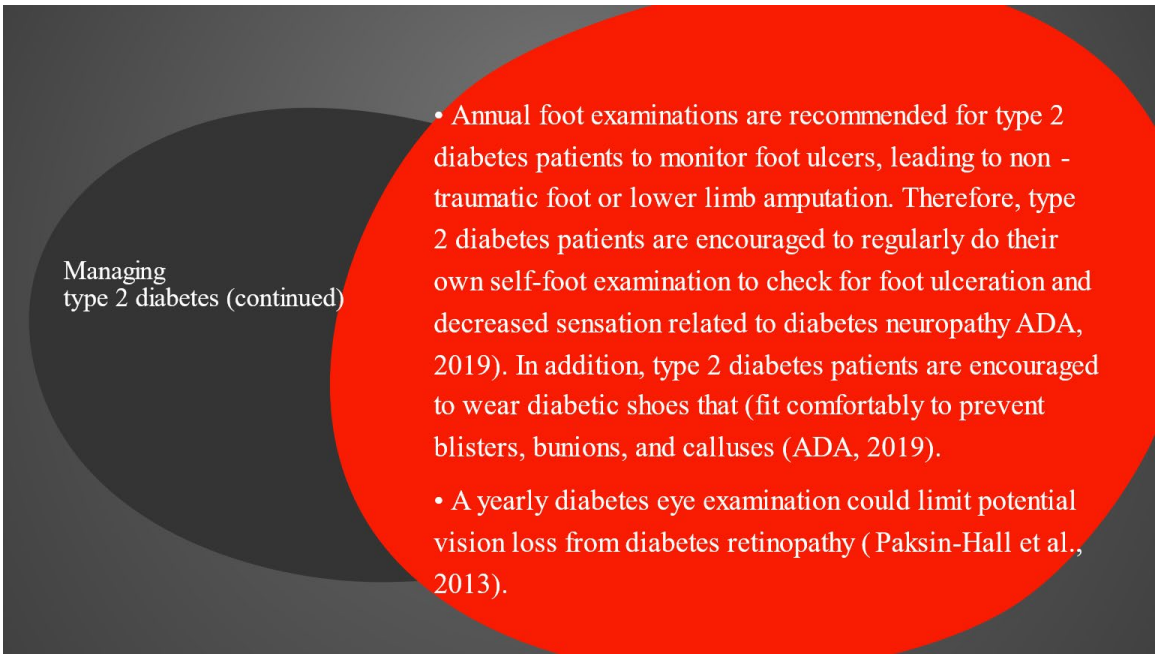

Type 2 diabetes – patient education
• Keeping blood sugar as close to normal will help prevent complications
• Learn as much about diabetes self -care
• Call the doctor's office or health clinic to schedule follow up appointment (ADA, 2019).

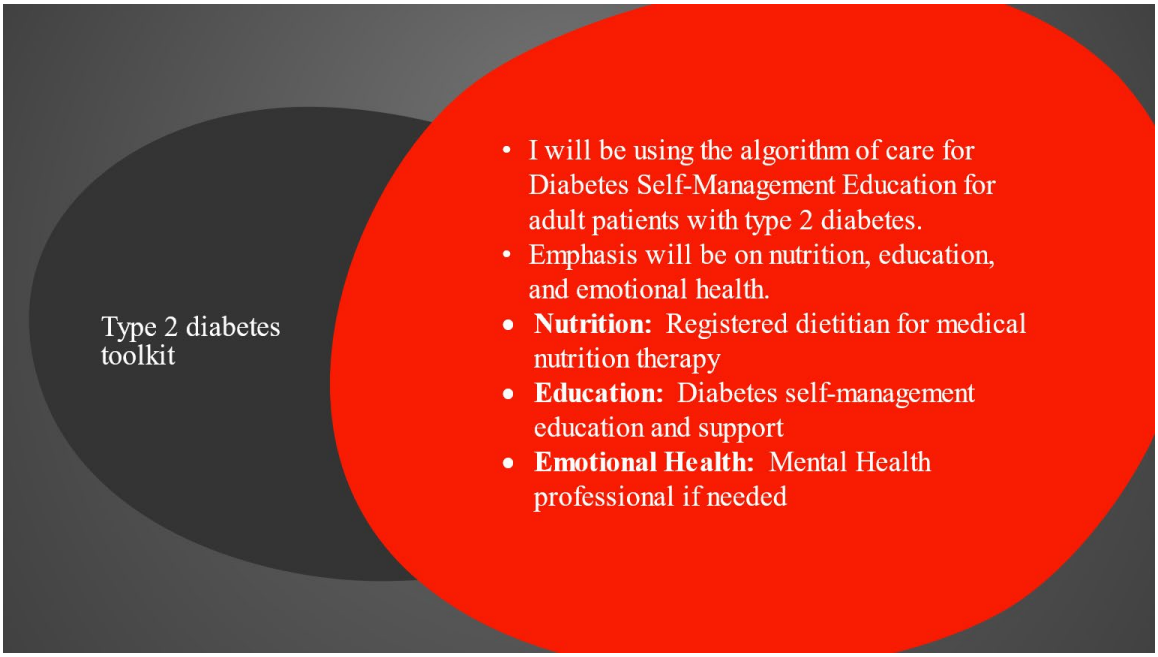

Type 2 diabetes (patient education continued)
• The patient should take their diabetes medication at the same time every day. This decreases the amount of glucose produced by the liver.
• A routine doctor's visit is essential for patients with type 2 diabetes mellitus (ADA, 2019).

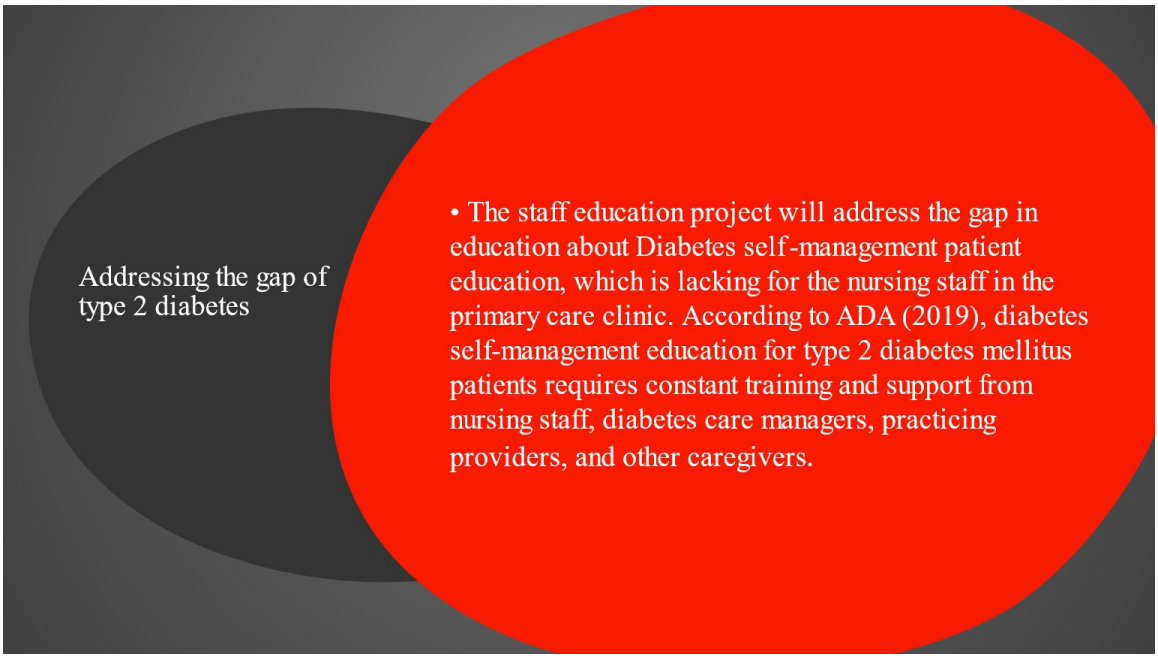

Type 2 diabetes (patient education continued)
• Before leaving the doctor's office, ask for the blood glucose test results, follow-up appointment, and how to use the meter. Check Hemoglobin A1C levels every 3 months.
• Blood glucose lower than 70 mg/dL is too low.
• Call the doctor or health clinic for low or high blood glucose levels (ADA, 2019).

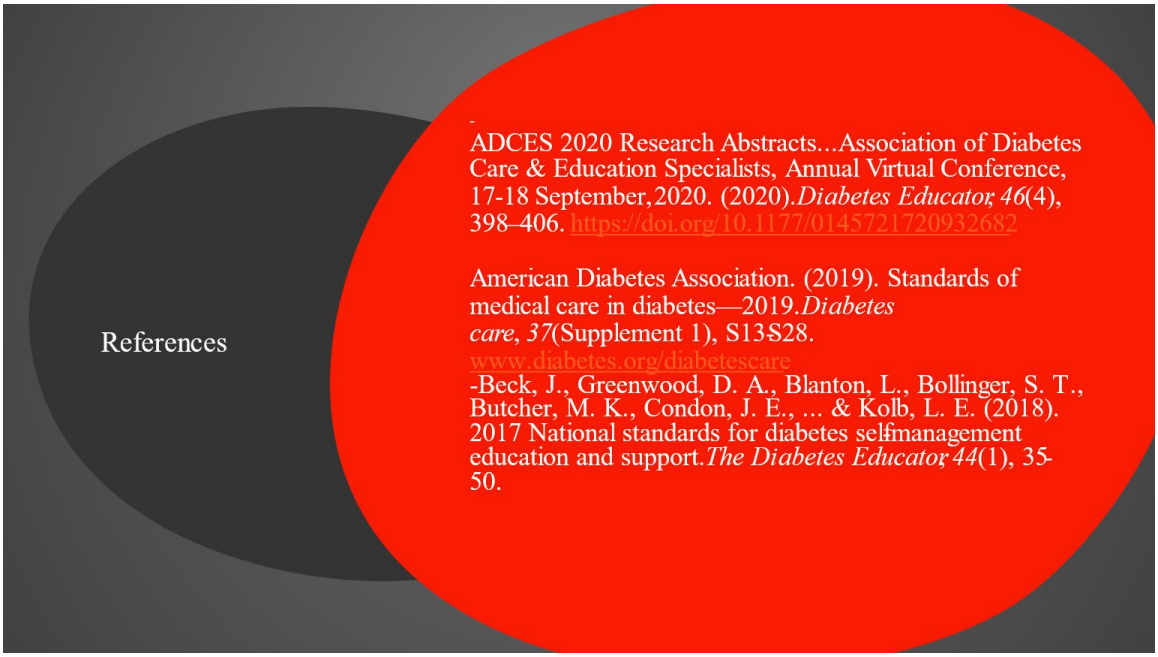

Type 2 diabetes (patient education continued)
• This encourages diabetes self-management education to help control hemoglobin A1c levels to less than 5.7% (Cunningham et al., 2018).
• Hemoglobin A1c level shows average blood glucose level in the past three months.
• Blood glucose goals for type 2 diabetes patients: - Before meals 70 to 130mg/L, 2 hours after meals should be less than 180 mg/dL and hemoglobin A1C of 7 % or less (ADA, 2019).


Managing type 2 diabetes (continued)
• Exercise control will help control weight, lower blood glucose, prevent heart disease, lower blood pressure, lower cholesterol levels, reduce stress, and look and feel better.
• Patients should engage in physical activity like walking at least 30 minutes a day five times a week will lower the blood glucose level, improve insulin sensitivity, decrease medication need, reduce body fat, improve cardiovascular benefits, and stress reduction for adult patients with type 2 diabetes (Breukelman et al., 2021).


Managing
type 2 diabetes (continued)
• Annual foot examinations are recommended for type 2 diabetes patients to monitor foot ulcers, leading to non - traumatic foot or lower limb amputation. Therefore, type 2 diabetes patients are encouraged to regularly do their own self-foot examination to check for foot ulceration and decreased sensation related to diabetes neuropathy ADA, 2019). In addition, type 2 diabetes patients are encouraged to wear diabetic shoes that (fit comfortably to prevent blisters, bunions, and calluses (ADA, 2019).
• A yearly diabetes eye examination could limit potential vision loss from diabetes retinopathy (Paksin-Hall et al., 2013).


Type 2 diabetes
toolkit
• I will be using the algorithm of care for Diabetes Self-Management Education for adult patients with type 2 diabetes.
• Emphasis will be on nutrition, education, and emotional health.
• **Nutrition:** Registered dietitian for medical nutrition therapy
• **Education:** Diabetes self-management education and support
• **Emotional Health:** Mental Health professional if needed


Addressing the gap of type 2 diabetes
• The staff education project will address the gap in education about Diabetes self-management patient education, which is lacking for the nursing staff in the primary care clinic. According to ADA (2019), diabetes self-management education for type 2 diabetes mellitus patients requires constant training and support from nursing staff, diabetes care managers, practicing providers, and other caregivers.


References
ADCES 2020 Research Abstracts...Association of Diabetes Care & Education Specialists, Annual Virtual Conference, 17-18 September, 2020. (2020). Diabetes Educator, 46(4), 398–406. https://doi.org/10.1177/0145721720932682
American Diabetes Association. (2019). Standards of medical care in diabetes—2019. Diabetes care, 37(Supplement 1), S13-S28. www.diabetes.org/diabetescare
-Beck, J., Greenwood, D. A., Blanton, L., Bollinger, S. T., Butcher, M. K., Condon, J. E., ... & Kolb, L. E. (2018). 2017 National standards for diabetes self-management education and support. The Diabetes Educator, 44(1), 35-50.

References (continued)

-Breukelman , G. J., Basson, A. K., Djarova, T. G., Du Preez, C. J., Shaw, I., Malan, H., & Shaw, B. S. (2021). Concurrent low -carbohydrate, high - fat diet with/without physical activity does not improve glycaemic control in type 2 diabetics. *South African Journal of Clinical Nutrition*, *34*(1), 18–21.

-Paksin-Hall, A., Dent, M. L., Dong, F., & Ablah, E. (2013). Factors Contributing to Diabetes Patients Not Receiving Annual Dilated Eye Examinations†. *Ophthalmic Epidemiology*, *20*(5), 281–287.