4-2022

Diabetes Education With a Focus on Blood Glucose Self-Management: Impacting the Frequency of Glucose Monitoring

Jennifer M. Young
jmy19a@acu.edu

This doctoral project, directed and approved by the candidate's committee, has been accepted bythe College of Graduate and Professional Studies of Abilene Christian University in partial fulfillment of the requirements for the degree

Doctor of Nursing Practice

Nannette W. Glenn, Ph.D.

Dr. Dr. Nannette Glenn, Dean
of the College of Graduate
and ProfessionalStudies

Date: 03/ 09 / 2022

Doctoral Project Committee:

Pattie Sunderhaus, EdD, DNP, MS, RN

Dr. Patricia Sunderhaus, Chair

Tonya Sawyer-Mcgee

Dr. Tonya Sawyer-McGee

Linda Gibson

Dr. Linda Gibson, Program Director

Abilene Christian University

School of Nursing

Diabetes Education With a Focus on Blood Glucose Self-Management: Impacting the Frequency of Glucose Monitoring

A doctoral project submitted in partial satisfaction

of the requirements for the degree of

Doctor of Nursing Practice

by

Jennifer M. Young, RN FNP-C

April 2022

Dedication

I dedicate all this hard work, time, and effort to my loving husband. You supported me through all the late nights and early mornings, through the tears and the moments of joy. Thank you for all your support and encouraging words.

Acknowledgements

I would like to acknowledge all the people who have made this journey for me possible. Dr. Sunderhaus has been an amazing guide throughout this journey in providing guidance not only on my project but also guiding me emotionally throughout the challenges that I experienced during this journey. I would also like to thank my husband, who has been a rock during the ups and downs of pursuing my doctorate. He provided me with the encouragement and tough love to keep going when there were times I wasn't sure that it was possible to achieve this dream. Thank you to my kids who encouraged me to do my homework like them and endured the numerous nights of me reading them to sleep with my textbooks.

Abstract

This quality improvement project was conducted to evaluate whether a focused educational session on self-management of blood glucose monitoring increased the frequency of monitoring for adult type II diabetics who were not taking insulin therapy. The purpose of this improvement project was to add to the body of research from this project. Currently, there are no recommendations for people with type II diabetes who are not taking insulin therapy regarding monitoring their blood glucose. This quantitative project was conducted online to reduce face-to-face contact during the COVID-19 pandemic. It was conducted online through diabetes support groups found on Facebook. Permission was obtained through the group administrators to post in the diabetes support groups and obtain participants. Participants were given information for the quality improvement project and were given a consent form. A pre- and postquestionnaire were utilized. These questionnaires were designed identically for statistical purposes. An educational video provided a focused educational session on self-monitoring blood glucose. There was a total of five participants utilized. A Wilcoxon signed-rank test was utilized for statistical analysis. The data was found to be not statistically significant except for one question. Question 15 was noted to be statistically significant in that participants were noted to have a decrease in physical activity to obtain optimal blood glucose levels after viewing the focused educational session.

Keywords: type II diabetes, blood glucose monitoring, self-management, noninsulin-dependent type II diabetics, focused education

Table of Contents

List of Tables

List of Figures

Chapter 1: Introduction

Chronic diseases are a significant health concern. With baby boomers increasing in age, there is an increasing concern for chronic diseases and healthcare (Bobitt et al., 2019). The Centers for Disease Control and Prevention (Centers for Disease Control and Prevention [CDC], 2017) defines chronic diseases as "conditions that last one year or more and require ongoing medical attention or limit activities of daily living or both" (para. 1). Over half of adults are found to have multiple chronic health conditions. Chronic diseases are prevalent in adults affecting six out of 10 adults (CDC, n.d.). Chronic diseases are found to be the leading cause of morbidity and mortality among individuals, resulting in significant health and economic impacts such as their independence, quality of life, and increased health expenses (Bobitt et al., 2019; CDC, n.d.). Diabetes is a chronic health disease that affects the body's metabolism and impacts multiple organs. In 2015, diabetes was listed as the seventh leading cause of death, affecting 252,806 individuals. In the last 20 years, the prevalence of diabetes has more than doubled (CDC, 2017).

With the increasing prevalence of type II diabetes, diabetes is a community concern. In 2015, it was estimated that 1.5 million adults were newly diagnosed with diabetes. The prevalence of type II diabetes varies by race. Diabetes is common among American Indians, Alaska natives, Hispanics, African Americans, and Asians. The prevalence of type II diabetes is influenced by the individual's education level, which could also be an indicator of socioeconomic status. An inverse relationship is found between type II diabetes and socioeconomic status. Adults who have less than a high school education are found to have a higher incidence of diabetes than those with a higher education level (Epocrates, 2020). Texas was noted to have a type II diabetic prevalence of 12.2% as compared to the United States at

10.8% in 2019 (United Health Foundation, 2019). With an increase in the prevalence of type II diabetes affecting the country and Texas, diabetes is a major health concern requiring attention.

The prevalence of diabetes is not only a health concern but also has significant financial implications. In 2012, the direct and indirect costs associated with diabetes were $245 billion, with an average medical expenditure of $13,700 per year. Individuals diagnosed with diabetes have an average expenditure of 2.3 times higher than those who do not have diabetes (CDC, 2017). Individuals in nonmetropolitan areas often lack the financial resources needed to manage their chronic diseases. For the adult patient population with type II diabetes, tertiary preventions are implemented. These interventions aim to promote activities and limit complications (Macha & McDonough, 2012). The goal of treating diabetes is to reduce the morbidity and mortality associated with type II diabetes. With increasing health expenses, interventions must be implemented to reduce associated healthcare expenses.

Healthcare in the United States is currently going through a major reform to address multiple healthcare expenditure factors. Healthcare reform was initiated with the implementation of the Affordable Care Act in 2010. Healthcare is shifting from inpatient to outpatient, where patients become increasingly accountable for their care at home. Shifting healthcare focus to the outpatient setting utilizes the patient in a shared decision-making strategy to manage their health. In this role, patients transition from passive participants to active participants in their care management. Therefore, it is essential to provide patients with the necessary tools to provide the most efficient care within their home environments to manage their chronic diseases. Patients are being encouraged to implement self-management strategies to reduce the healthcare burden.

This Doctor of Nursing Practice (DNP) project aimed to evaluate the efficacy of an online diabetes educational session focused on the self-management intervention of monitoring

blood glucose levels. The outcomes examined would be whether the online educational session affected the frequency in which individuals monitor their blood glucose.

Chapter 1 consists of exploring the problem being addressed, the background of the issue, the purpose of the project, the significance of the project, the nature of the project, the research question, the hypothesis, the theoretical framework guiding the project, the definitions utilized about this DNP project, and the scope and limitations associated with this DNP project. Chapter 1 provides the foundation upon which the project will be built.

Problem Statement

This DNP project's population was adults between the ages of 18 and 64 years who had been diagnosed with type II diabetes and were noninsulin-dependent. This DNP project's intervention was implementing an online diabetes educational course focusing on self-management strategies, particularly blood glucose monitoring. The outcome examined was the frequency of blood glucose checks. The outcome examined whether the intervention influenced the frequency at which individuals monitor their blood glucose. The PICOT method of asking a question was utilized to guide the research. There are five components to a PICOT question:

(P) population,

(I) intervention,

(C) control,

(O) outcome, and

(T) time.

The question I asked was: How do adult noninsulin-dependent type II diabetics between the ages of 18–64 years of age (P) who receive a diabetic educational session focused on blood glucose monitoring (I) affect the frequency of self-monitoring, (C) and do they experience an

increase in self-monitoring (O) within a two-month period (T)? The outcome measured by this DNP project was the frequency of monitoring blood glucose.

Background

Chronic disease can be managed through the utilization of self-management methods. Self-management is an established approach to assist patients in coping with the challenges associated with their chronic conditions. Self-management is a broad concept that has multiple definitions. An overall description of self-management is patient education, which promotes the patient to develop strategies to deal with signs and symptoms of the disease, monitoring, managing medications, maintaining nutrition, and adapting accordingly (Angwenyi et al., 2018; Bobitt et al., 2019; Cameron et al., 2018; Chen et al., 2017; Grady & Gough, 2014). Individuals are taught to manage their diseases daily and empowers patients to be active participants in their health by utilizing self-management interventions (Grady & Gough, 2014). This approach differs dramatically from traditional practices in healthcare. Previously, providers would discuss the treatment plan without patient involvement. Self-management requires patient education regarding problem-solving strategies and action plans to improve and maintain their health (Chen et al., 2017).

There are two goals of self-management. One goal of self-management is having all participants involved in an individual's care working together, such as the family, community, and health providers (Grady & Gough, 2014). Another goal of self-management is to move the patient from being a bystander in their care to becoming an active participant, enabling the patient to develop methods of managing their disease throughout all aspects of their life (Conway et al., 2017).

Several self-management strategies can be implemented in treating and managing adult patients with type II diabetes. Some self-management strategies implemented for this patient population are patient education, eating well, physical activity, obtaining a healthy weight, preventing complications, and managing blood sugar levels. Lifestyle changes are an essential component of the treatment and management of diabetes. Lifestyle changes comprise diet, physical activity, decreased alcohol use, smoking cessation, and weight reduction. These interventions provide the cornerstone of type II diabetes care. Implementing these strategies into the care plan of this patient group is essential (Epocrates, 2020).

Lifestyle changes are an essential component of treating and managing diabetes. A nutrition and exercise program that is individualized to the patient can greatly improve glycemic control. Nutrition management is focused on a reduced-calorie diet with a focus on weight loss. It is essential in discussing nutrition that the plan is tailored to the patient's preferences. Tailoring the plan to the patient increases compliance and improves the longevity of the intervention. Tailoring their nutrition plan to their preferences empowers the patient to achieve their goals. The basic components of a type II diabetic diet should consist of a mix of carbohydrates, fats, and proteins with a reduction in sugar consumption. The overarching goal of nutritional therapy is to balance the patient's glycemic index and weight reduction (CDC, 2017; Epocrates, 2020).

Physical activity is another self-management strategy geared toward weight reduction, which should always be included in the treatment plan of type II diabetics. Physical activity should be moderate in intensity, which will aid in weight reduction. In general, physical activity should consist of three to four sessions of aerobic activity per week. The sessions should last at

least 40 minutes in duration and be rated as moderate to vigorous intensity (CDC, 2019; Epocrates, 2020).

Another intervention that patients can use to self-manage their diabetes is a glucometer to check their blood glucose levels. This self-management intervention can provide the individual with valuable information regarding their interventions' efficacy and provide information regarding their health status. Patients can track their blood sugars and monitor for trends utilizing a glucometer. This information can be essential in providing care to a person with type II diabetes who is not on insulin but is prone to hyperglycemic and hypoglycemic episodes. This method can also provide patients with the information in implementing precision health by adjusting their own lifestyle measures based on their readings (Epocrates, 2020).

Purpose

This DNP qualitative project's purpose was to evaluate a focused diabetic educational session on blood glucose monitoring for adult type II noninsulin-dependent diabetics. This project evaluated the frequency of blood glucose monitoring pre- and posteducational sessions to evaluate the change in frequency. The health belief model was the theoretical framework that guided this study in understanding the adoption of self-management strategies. Self-management is an essential component of managing chronic health conditions. Understanding how a focused educational session impacts retention can further influence teaching methods for individuals who have chronic health conditions. The purpose of implementing this project was to provide additional insight into how a diabetic educational course with a specific focus could influence individuals in implementing these self-management strategies.

Significance

The data obtained from this project can aid clinicians in determining if routinely monitoring blood glucose is a beneficial self-management technique in noninsulin-dependent type II diabetic patients. Gaining further insight into this self-management strategy will aid in allocating healthcare expenditure. In 2017, the total cost associated with diabetics in the United States was $327 billion, with $237 billion in direct costs and $90 billion in reduced productivity. Diabetic supplies cost approximately 15% of the total costs (American Diabetes Association [ADA], 2018). Examining effective self-management interventions can reduce healthcare utilization through implementing preventative measures and slowing disease progression. Implementing effective self-management interventions can reduce healthcare utilization and expenditure. Type II diabetes has been studied extensively to enhance our understanding of the disease process. A thorough examination of the varying aspects pertaining to diabetes management such as lifestyle interventions, self-management, disease process, reversibility, prognosis, and medications has been conducted. Results of multiple studies indicated that a personalized approach along with organized and structured educational sessions were pivotal to managing this disease (Chan et al., 2020). The specific aim of this DNP project was to examine if implementing a focused educational session on self-management strategies would increase the frequency of blood glucose monitoring.

Nursing

An integral component of the field of nursing is patient education. Patient education enhances the patients' understanding of their medical conditions and empowers them in their care. With the transformation of healthcare and a focus on the importance of efficiency and effectiveness of healthcare, patient education becomes essential in managing chronic health

conditions (Bergh et al., 2015). This DNP project will benefit the field of nursing by providing additional evidence supporting self-management interventions and focused patient education. There is inconclusive evidence regarding the self-management intervention of routinely monitoring blood glucose in noninsulin-dependent diabetic patients (Farmer et al., 2012; George et al., 2015; Harashima et al., 2016; Isaksson et al., 2015).

Nursing is strongly associated with patient education. Nurses are often the bridge between patients and providers in providing patient education. They are advocates for them and empower patients. They clarify information for patients to improve their understanding. Nurses provide patients with education to guide patients in their decision-making process. Nurses need to be informed regarding evidence-based recommendations for self-management interventions for patients. It is important to implement practices that benefit patients to improve or maintain their health. Diabetic patients rely heavily on patient education to manage their chronic health conditions. It is essential to provide nurses with evidence-based recommendations so that they will be able to translate that evidence into practice and influence individual outcomes.

There are eight essential elements associated with doctoral-prepared nurses. Of those eight essentials, Essential II focuses on implementing quality improvements through the translation of research into practice (DeCapua, 2016). Essential II guided the basis of this DNP project by translating research into applicable clinical practice. There was inconclusive evidence to support whether self-monitoring was indicated in type II noninsulin-dependent diabetics. Previous studies showed inconclusive data regarding the clinical benefits of routinely monitoring blood glucose in noninsulin-dependent type II diabetics (Farmer et al., 2012; George et al., 2015; Harashima et al., 2016; Isaksson et al., 2015). However, these studies did not examine if the patients experienced a benefit from a focused educational session on a single self-management

intervention. The doctoral-prepared nurse practitioner can lead the way in translating effective patient education and self-management interventions into clinical practice.

Society

This DNP project will benefit society by providing further insight into self-management strategies for adult noninsulin-dependent type II diabetics. Society will benefit from this project in multiple ways. Society can benefit from gaining a deeper understanding of effective self-management strategies. Furthering the understanding of self-management strategies can guide in appropriately allocating financial resources. Routinely checking their blood sugar could be viewed negatively from a social standpoint, as it would alert others of the illness, and the time it would take to check it. The potential positive social implications of routinely checking one's blood sugar are increased self-awareness, influencing others, improved diabetes control, and reduction in diabetes-associated complications.

Costs associated with diabetic supplies can be reallocated to self-management interventions that are found to be effective and efficient. The allocation of resources to appropriate self-management interventions can be implemented through improved insurance coverage of diabetic supplies. As of 2017, the ADA conducted a cost analysis of diabetes where it was discovered that individuals with diabetes were found to experience 2.3x greater health costs. The annual costs of diabetes management were $327 billion, 15% of which was associated with diabetic supplies (ADA, 2018). Implementing the self-management intervention of monitoring blood glucose will increase patient awareness and positively impact the individual's control over diabetes. With improved diabetes control and reduced complications from diabetes, there is a $67 to $105 reduction in cost per patient per month (Fitch et al., 2013).

Organizations

This DNP project will benefit organizations that provide patient education, such as the American Diabetes Association and the Center for Disease Control and Prevention, by providing further insight into effective self-management techniques. There are multiple organizations devoted to diabetic education and chronic disease management. Providing these organizations with further evidence supporting blood glucose monitoring in this patient population can improve diabetes control and reduce healthcare costs.

Nature of the Project

The methodology used for this DNP quality improvement project was a quantitative study design using a convenience and snowballing sample method. Convenience and snowball sampling method is a nonprobability-based sampling method. This method was typically utilized for its ease of use, affordability, and simple design. The limitation of utilizing this methodology was the inability to extrapolate the results based on potential biases that may skew the data (Jager et al., 2017). Participants for this study were obtained from online diabetic support groups through the Facebook platform. Participants were approached via a posting on the group discussion board inviting individuals to participate. Potential participants were then emailed a link to the diabetes educational study.

A pre- and postquestionnaire was used to gather data for the project. The prequestionnaire consisted of questions determining eligibility along with evaluating the current frequency of monitoring. The Diabetes Self-Management Questionnaire (DSMQ) was used for this DNP project (see Appendix A). The postquestionnaire was identical to the prequestionnaire but was taken two months after the educational session (see Appendix B). Permission was obtained to use the tool (see Appendix C).

The expected outcome of implementing the questionnaires was to develop a further understanding of how a focused educational course affected the frequency of monitoring blood glucose levels. The current literature was inconclusive regarding the benefits of routinely monitoring blood glucose levels in noninsulin-dependent type II diabetics (Farmer et al., 2012; George et al., 2015; Harashima et al., 2016; Isaksson et al., 2015).

Question Guiding the Inquiry (PICOT)

The problem being evaluated in this project was whether adults between the ages of 18–64 years of age and noninsulin-dependent type II diabetic patients perceived a focused educational course as informative in guiding the frequency of monitoring. The PICOT format used to evaluate this topic further was meaningful. The question being asked was: How do adult noninsulin-dependent type II diabetics between the ages of 18–64 (P) who receive a diabetic educational session focused on blood glucose monitoring (I) affect the frequency of self-monitoring, (C) and do they experience an increase in self-monitoring (O) within a two-month period (T)? The population being examined was 18–64-year-old type II diabetics who were not currently taking insulin therapy. The intervention implemented was a focused diabetes educational session on blood glucose monitoring. The expected outcome was an increase in the frequency of monitoring. The time frame for this quality improvement project was two months.

Hypothesis

The hypothesis for this quality improvement project was that patients who received a focused educational session on monitoring blood glucose would increase the frequency of their own monitoring. Often patients are presented with educational information during their initial diagnosis, where they are overwhelmed with their new diagnosis. Other times patients are presented with an overwhelming amount of information that is difficult for patients to retain and

effectively implement interventions into their daily routines. The goal of implementing this study was to understand further effective teaching interventions that promote health literacy and self-efficacy in patients.

Theoretical Framework

The health belief model is a theoretical framework that helps explain whether individuals perceive their illness as a threat and whether they believe the recommended intervention will be enough. This theory applies to the outlined DNP project. The DNP project examined the patient's perception of their health by implementing an intervention. The health belief model examines individuals' perceptions of their health and how they perceive the designated intervention will impact their health (LaMorte, 2019).

The health belief model has several advantages to being utilized. Early studies utilizing this theoretical model found that identifying the individual's perceived susceptibility, benefits, and barriers were associated with the intended intervention. Perceived severity was found to be associated less often with the desired health outcome (LaMorte, 2019).

There are limitations associated with the health belief model. This theoretical framework does not directly consider the following factors: social acceptability or environmental and economic factors. There are several assumptions associated with the health belief model. One assumption is assuming everyone has access to an equal amount of information. Another assumption associated with this condition is assuming that the cues to act are prevalent and that they are determining health decisions. Another limitation of this theoretical framework is that it does not account for other aspects of individuals, such as attitudes, beliefs, and habitual behaviors. These aspects may further influence the individual's decision-making process (LaMorte, 2019).

Background

The health belief model provides a theoretical framework to understand the motives behind the patient's decisions. This theory examines individuals' beliefs about what they are perceived to be at risk for, their perceptions of health, and the benefits of acting. This model examines whether individuals see their illness as a threat and whether they believe the recommended action will be enough. Two underlying assumptions are associated with this theory. One is that individual's desire to avoid illness. The second assumption is that individuals believe that actions and events will enable a cure (LaMorte, 2019). These assumptions can overestimate the individuals desire for change and implementing a particular intervention.

This theory applied to this project in that the health belief model and this DNP project evaluated the patient's motives and how information may influence the individual to act. The health belief model provided the theoretical framework for this DNP project. The main goal of this DNP project was to evaluate patient behavior, and the health belief model provided a framework for explaining patient behavior.

Historically, nursing has drawn on the application of experiences and or policies. However, evidence-based nursing has shifted to implementing theory-driven quality care, causing a dramatic shift in nursing care (Chism, 2016). Theory-driven care uses theoretical frameworks to explain experiences and provide mental patterns organizing knowledge and information (Chism, 2016; Nilsen, 2015). These theoretical frameworks provide evidence in support of nursing interventions along with an understanding of human nature.

Theoretical frameworks are essential in providing a valuable understanding of research and its clinical application. The health belief model is a health theory used as the foundation for this DNP project. This model is one of the most established models relating the health behavior

(Roeckelein, 2006). This model was initially developed in the 1950s to understand individuals' behavior in utilizing or not utilizing preventative services. However, this theory has transformed into a theory describing the individuals' beliefs about what they are perceived to be at risk for, their perceptions of their health, and the risks and benefits of acting (LaMorte, 2019). Individuals will determine if they act upon the information given based on their individual perception of a threat and how serious they view it or how vulnerable they perceive them (Roeckelein, 2006). Six constructs make up the health belief model. The constructs are (a) perceived susceptibility, (b) perceived severity, (c) perceived benefits, (d) perceived barriers, (e) cues to action, and (f) self-efficacy (LaMorte, 2018). These constructs provided the foundation of this theoretical framework. A visual representation of the health belief model provides a visual overview of this model (see Appendix D).

Constructs

The construct of perceived susceptibility is the first construct of the health belief model. This construct is described as the individual's perception of their risk of potentially obtaining the disease. This construct has a wide variation in interpretation as there are numerous variations in individual feelings regarding their vulnerability and perception of getting a certain health condition. The variability of perception can vary from feeling not at risk for obtaining a health condition or at the greatest risk of obtaining a health condition (LaMorte, 2019).

The second construct of the health belief model is the perceived severity. This construct refers to the individual's perception of how serious contracting an illness would be. Another variable associated with this construct is how serious the individual views leaving the illness untreated. Like the first construct of perceived susceptibility, there is wide variation in an individual's perception of severity. However, this construct does consider other factors that may

influence the individual, such as the medical and social consequences of the potential illness (LaMorte, 2019).

Perceived benefits are the third construct of the health belief model. This construct attempts to describe the individual's perception of the effectiveness of actions available to reduce the potential of the illness. This third construct builds upon the last two constructs of perceived susceptibility and how implementing certain interventions will benefit the individual. This construct relies on accepting the recommended action as the individual perceives it to be beneficial to their health (LaMorte, 2019).

The fourth construct is perceived barriers. This construct examines the individuals perceived barriers to performing health action. Perceived barriers are individualized to the individual. Individuals weigh the pros and cons associated with the intervention and determine whether to implement it. The individual can perform a cost-benefit analysis, the time associated with it, and the social constraints to determine the intervention's feasibility (LaMorte, 2019).

Cues to action are the fifth construct of the health belief model. This construct identifies the stimulus needed to trigger the decision-making process and to accept the intervention. The cues to action can be internal and external. A potential internal cue could be seeing their A1C increase over time. An external cue could be seeing a family member progress to utilizing insulin therapy. These cues are the driving factors that influence individuals to commit to the designated action plan (LaMorte, 2019).

The sixth construct of self-efficacy was recently added to the health belief model. This construct refers to the individual's perception of their ability to achieve behavior. Self-efficacy was added to the health belief model in the 1980s. It is a construct in several behavioral theories.

Self-Efficacy directly relates to whether the individual will accomplish the desired outcome (LaMorte, 2019).

Operational Definitions

Health belief model. This is a theoretical framework that helps explain whether individuals perceive their illness as a threat and whether they believe the recommended intervention will be enough (LaMorte, 2019).

Hemoglobin A1C. A percentage of hemoglobin A with bonded glucose used to guide diabetic management (Mahoney, 2020).

Noninsulin-dependent type II diabetic. An individual who has type II diabetes that is not currently on insulin therapy (Rodger, 1991).

Quality of life. Standard of health, happiness, and comfort experienced by someone or a group of persons (Lexico, 2020a).

Self-assessment. Evaluating oneself and their actions, attitudes, or performance (Lexico, 2020b).

Self-efficacy. Belief in one's capabilities to organize and execute courses of action. Predictor of health-related behaviors and outcomes (Cameron et al., 2018).

Self-management. Management of or by oneself; taking responsibility for one's own behavior and well-being complements traditional patient education. Promote development in problem-solving skills and specific plans to help individuals make informed health decisions and take appropriate actions with changes in circumstances or disease (Cameron et al., 2018).

Tertiary prevention. The focus is on someone who already has the disease. It is utilized to improve their quality of life. The goal is to reduce disability, delay complications, and restore function (Institute for Work and Health, 2015).

Type II diabetes. A chronic health condition characterized by insulin resistance and episodes of hyperglycemia (Rodger, 1991).

Scope and Limitations

This DNP project examined individuals between the ages of 18–64 diagnosed with noninsulin-dependent type II diabetes and the frequency at which blood glucose (BG) was monitored before and after an online educational session. The intended outcome was to provide additional insight into how a focused educational session could increase the frequency of glucose monitoring. The information gained from this project can provide practitioners with a deeper understanding of the importance of a focused educational session to improve desired outcomes.

The inclusion criteria for participating in this DNP project were adults between the ages of 18 and 64. These patients were diagnosed with type II diabetes and were not currently receiving insulin therapy. They had the mental capacity to consent on their own ability and had the dexterity to utilize a glucometer.

The exclusion criteria for this DNP project were those individuals who were currently receiving insulin therapy. Routinely monitoring blood glucose levels is recommended for those patients receiving insulin therapy and, therefore, not applicable to this project's scope. Other exclusion criteria were vulnerable populations such as pregnant women, children, the elderly, and prisoners. The recommendation for the aforementioned patient populations received specific recommendations for routinely monitoring their blood glucose levels and fell outside this project's scope.

This DNP project's limitations were that it was only conducted online utilizing a convenience and snowball sampling method limiting the generalizability of data related to the

potential for decreased diversity of participants. Another limitation was that the study population was small, which limited the ability to extrapolate the results.

Chapter Summary

In summary, Chapter 1 introduced the DNP project being conducted. Data was interpreted to evaluate the adult noninsulin-dependent type II diabetic patient's frequency of monitoring blood glucose and how it was influenced by a focused educational course. The PICOT question guided the DNP project, and the health belief model was the theoretical foundation of this project. The limitations of the project have been outlined, along with the inclusion and exclusion criteria. Overall, this DNP project will quantify the patient's response to a focused educational session.

Chapter 2: Literature Review

Chapter 1 provided an overview of the importance of evaluating the patient's perception of self-management interventions. This DNP project's purpose was to evaluate the effect of implementing a focused educational course and its impact on blood glucose monitoring. The overarching aim of this project was to determine if routinely monitoring blood glucose levels in noninsulin-dependent type II diabetics increased the frequency of monitoring blood glucose. The findings from this project will enable providers to recommend self-management strategies for this patient group that are beneficial to managing their chronic health conditions. It will also positively influence the interactions between patients and providers. The anticipated long-term result is that healthcare providers can make informed recommendations regarding self-management strategies with a deeper understanding of patients' responses to focused educational interventions.

Chapter 2 will build upon the previously established foundation of this project. Chapter 2 will examine the existing literature regarding the self-management of routinely monitoring blood glucose. This chapter intends to review the literature that guided the DNP project and provide a deeper understanding of the literature regarding this topic and the gaps in evidence-based recommendations. A historical overview of the literature will be examined, along with the current literature, research findings, and search limitations of this study. The summary will provide an overview of the main points covered in this chapter.

Historical Overview

Diabetes is a chronic health condition that has been around for centuries. The identification and treatment of diabetes have changed over the years as technology has advanced. In the 1500s, diabetes was initially tested by the sweetness of an individual's urine. The

advancement of technology testing and monitoring for diabetes has progressed from testing urine to measuring glucose in the urine to blood testing. Currently, monitoring for diabetes ranges from the point of care testing to hemoglobin A1C measurements. A hemoglobin A1C measurement provides an average of the individual's blood sugar for the past two to three months (Kreider, 2020; Mahoney, 2020). With a decrease in cost, self-monitoring of blood glucose has become more popular (Kreider, 2020).

Diabetes is diagnosed by the ADA guidelines with an A1C greater than 6.5% as of 2010 (Mahoney, 2020). Glycemic targets for those diagnosed with diabetes are maintaining an A1C of less than 7% in nonpregnant adults. A more stringent approach is appropriate for those individuals who do not have a high risk for hypoglycemia, have a lower rate of disease duration, have no cardiovascular disease, and have a longer life expectancy. The stricter goal for the latter group is 6.5% (Kreider, 2020).

The current management approach for diabetes outlined by the ADA recommends that lifestyle measures be the cornerstone intervention. Lifestyle recommendations consist of balancing nutrition and exercise. An intervention that may be indicated in preventing complications is pharmacological therapy. Pharmacological therapy can range from implementing one medication to multiple medications, which affect different parts of the body, to facilitate the normalization of blood glucose levels (George et al., 2015).

Self-monitoring blood glucose is a Food and Drug Administration (FDA) approved way to monitor blood glucose levels. The accuracy of self-monitoring of blood glucose is dependent upon several factors. Those factors are the user and the instrument. This process uses an enzymatic reaction that either uses glucose oxidase or dehydrogenase approach. The oxidase approach is sensitive to oxygen (O_2) availability and is only utilized when individuals have a

normal O_2 and are not receiving supplemental O_2. This approach utilizes capillary blood. There are several limitations to this enzymatic analysis. One limitation is that it can have false low readings with arterial samples or oxygen supplementation. Another limitation is that it can have false highs with low O_2 concentrations from hypoxia, venous sample, or high altitude. The other enzymatic approach is glucose dehydrogenase glucometers. The benefit of this type of glucometer is that it is not sensitive to O_2 concentrations. However, this type of measuring system does have test strips that are more sensitive to temperature changes (Mahoney, 2020).

Other difficulties associated with the use of glucometers are utilizing expired test strips, altered humidity, or altitude changes. Both processes utilize an enzymatic approach and are highly sensitive to changes that can affect the glucose reading. If an individual fails to wash their hands prior to conducting the test, user error can occur due to the contamination of results. An example of this is when an individual consumes a banana and tests their blood sugar without washing their hands. The sugars from the banana will cause the reading to be falsely elevated (Mahoney, 2020).

Another approach to monitoring diabetes is with an A1C. This type of measurement takes an average of the past two to three months to provide a percentage. The benefit of utilizing this method is that fasting is not necessary and is not affected by stress, smoking, or exercise. However, the reliability of this measure can be affected by hemoglobinopathies such as anemia, pregnancy, or other health conditions (Kreider, 2020; Mahoney, 2020). This measurement also does not indicate specific episodes of hypo or hyperglycemia (Kreider, 2020).

Search Strategy

A systematic literature search was conducted to identify evidence within published literature to provide evidence for the DNP project. Clinical databases were utilized using

terminology and filters as appropriate. Search criteria were developed to guide the search. The search criteria for this study were noninsulin-dependent type II diabetics, adults 18 years and older, and studies conducted in English. Studies that were not in English were excluded from the literature review. These studies were excluded to avoid potential translation errors that could potentially skew the data. All searches were done on core databases such as Cinahl, the Cochrane Library, MEDLINE, and PsycInfo.

Additional search strategies were implemented to obtain additional studies relevant to the literature review. References for relevant studies provided additional literature for the review. Another search strategy was examining other search strategies utilized in systematic reviews and followed the same search pattern. These additional methods provided additional literature for the review. Grey literature or unpublished literature was not utilized in the literature review. Additional literature utilized were specific guidelines relating to noninsulin-dependent type II diabetics.

Current Findings

Extensive research has been conducted evaluating the recommendations for self-monitoring blood glucose levels in the diabetic population that is not at risk for hypoglycemic events. Recommendations range from monitoring blood glucose multiple times a day to not indicated. There is much debate on this topic regarding the efficacy of blood glucose monitoring in this population group. Arguments evaluate the efficacy of this intervention based on cost, stress, the potential for harm, and the potential for benefit. Some researchers argue that this intervention in this patient population provides valuable information to guide the individual in self-managing their diabetes. Others argue that this self-management intervention does not provide a benefit but causes increased stress for the patients through physical pain, emotional

stress regarding readings, and financial hardships (Farmer et al., 2012; George et al., 2015; Harashima et al., 2016; Isaksson et al., 2015). With varying recommendations, it is important to determine the best approach for the noninsulin-dependent diabetic population to provide evidence-based care.

The study conducted by Harashima et al. (2016) followed the International Diabetes Federation, which recommends self-monitoring blood glucose levels to achieve glycemic control. Researchers conducted a 24-week study at a single cohort center. They evaluated the change in A1C over 24 weeks and evaluated the differences between no checking and variable frequencies. The data from Harashima et al.'s (2016) study indicated that self-monitoring greater than one time a day increased the level of distress, depression, and frustration (Hou et al., 2014). Indicating there may be an optimal frequency for monitoring blood glucose. There was also noted to be an increase in stress from participants, which had an inverse correlation with an understanding of the interpretation of results. Without any self-monitoring being performed, there was a noted increase in hemoglobin A1C (Harashima et al., 2016).

Tanenbaum et al. (2015) examined self-monitoring in diabetic patients through the utilization of in-depth interviews with diabetics that were considered excellently controlled. The researchers of this study wanted to examine how this patient population evaluated their efforts and what information provided guidance in self-managing their diabetes. The patient population for this study consisted of individuals who were 18 years and older. They utilized two sites and outlined inclusion and exclusion data. The interview process took approximately one to two hours, and the individuals were compensated 30 dollars. The data analysis was a two-phase process that consisted of coded themes. Tanenbaum et al. (2015) found several themes regarding self-monitoring with blood glucose. They found that several patients utilized their blood glucose

levels to monitor the efficacy of interventions. The participants also utilized a varying frequency of monitoring their blood glucose to understand their own trends. Some individuals experimented with foods and maintained logs. Self-monitoring blood glucose levels also enabled clinicians and the participants to problem-solve out-of-range readings and trial and error personalized interventions (Hou et al., 2014; Tanenbaum et al., 2015). Participants found the most success in checking their blood sugar when their device was placed in a location that reminded them. The participants also encouraged individuals to have multiple meters to be able to check as needed (Tanenbaum et al., 2015).

Self-monitoring provided a means of coherence for patients. It enabled the participants to understand the effect of the interventions. By obtaining real-time information, participants could adjust their lifestyle measures to improve their control over their diabetes further. Most of the participants found that self-monitoring their blood glucose was a key intervention in providing them feedback and adopting specific health behaviors. Self-monitoring blood glucose (SMBG) levels provide a bridge between interventions and real-time feedback regarding the individual's blood sugar (Farmer et al., 2012; Tanenbaum et al., 2015). Sapkota et al. (2017) found in their research that although SMBG monitoring may not provide a benefit for all individuals. For some individuals, it can provide valuable information to guide them in treating their diabetes.

Other research studies examining self-monitoring blood glucose found this intervention as an ineffective self-management strategy for noninsulin-dependent diabetics. Although SMBG may provide essential clinical behavior management information, there is no convincing evidence supporting its implementation (Farmer et al., 2012; Malanda et al., 2013). Multiple researchers investigating blood glucose monitoring discovered that this intervention in noninsulin-dependent type II diabetics did not appear to be cost-effective nor improve quality of

life and that self-monitoring can potentially be distressing to patients. Malanda et al. (2013) and Sapkota et al. (2017) found through their research that patients may experience increased stress with monitoring their blood sugar and not understanding how to act upon the information (Malanda et al., 2013; Sapkota et al., 2017).

The literature presents conflicting recommendations regarding SMBG in noninsulin-dependent diabetics (Farmer et al., 2012; George et al., 2015; Harashima et al., 2016; Hou et al., 2014). Therefore, it is essential that further research be implemented in examining how the patient perceives this self-management intervention and how it impacts their health. Understanding how patients perceive SMBG can further guide clinicians in recommending this as a self-management intervention.

Diabetes is a chronic health condition that affects the individual in a variety of areas. The complexity of diabetes relies heavily on extensive patient education (Kjellsdotter et al., 2020). Often in a busy practice setting, patient education is briefly discussed. Providing a more structured patient educational session can improve the patient's understanding of their disease process and the importance of self-management interventions (Kjellsdotter et al., 2020). The study conducted by Edward et al. (2019) evaluated the effects of a brief lifestyle self-management education for patients with epilepsy. The researchers of this study found that a brief educational session helped improve resilience, satisfaction, mental health, and medication adherence (Edward et al., 2019).

Search Limitations

There were several exclusion criteria for the studies selected. NonEnglish studies were excluded related to the potential skew of information with translation to English. Another exclusion criterion was that the participants could not have type I diabetes, have prediabetes, or

gestational diabetes. These chronic health conditions require different forms of treatment and did not align with the selected population being examined by this study. Another exclusion criterion was if the individual was receiving insulin therapy. Individuals requiring insulin therapy were recommended to monitor their blood glucose to examine control and to identify hypoglycemic events.

Some limitations were identified with the studies utilized for this DNP project. Several studies allowed the participants to allocate which group they would participate in. Multiple studies used small sample sizes (Harashima et al., 2016; Hou et al., 2014). The participants were able to determine how often they wanted to perform their self-monitoring or if they wanted to be in the nonmonitoring group. Allowing the participants to determine which subject group they were in can unintentionally skew the data results. Harashima et al. (2016) had a small study size that impacted the generalizability of the study results. Extrapolation of the results was limited based on participants utilized and the potential for the development of bias (Harashima et al., 2016).

The study by Tanenbaum et al. (2015) was used in this review that presented some limitations regarding their study implementation. The study was limited by the number of visits and the failure of providers to intensify treatments. Another limitation that greatly impacted the reproducibility of the study was the variability of interviews and that the studies utilized a retrospective approach. This study did not capture the daily struggle. Multiple interviewers also conducted interviews; therefore, biases could be present. Participants were also reviewed based on their success at managing their chronic health conditions and could also provide grounds for bias to develop.

Chapter Summary

In summary, Chapter 1 introduced the DNP project being conducted, while Chapter 2 examined the literature regarding this topic. Chapter 2 also provided insight into how the literature was obtained for this review. A discussion of the limitations of the search criteria highlighted the limitations of previous studies conducted. This chapter provided the historical aspects of diabetes and the current literature. Comparing the historical approach to current literature highlighted the progressive change between the two approaches and exemplified the importance of implementing evidence-based interventions.

Chapter 3: Methodology

Chapter 1 described the importance of a focused educational session for blood glucose management. Chapter 2 examined the existing literature regarding a focused diabetes educational session and self-management. This DNP project's purpose was to evaluate the effects of focused diabetes education and its impact on the frequency of monitoring blood glucose. This project aimed to evaluate the efficacy of a focused diabetes education course discussing the self-management intervention of routinely monitoring blood glucose and increasing the frequency of monitoring. The findings from this project enabled providers to recommend the self-management strategy of monitoring blood glucose for this patient group, which is beneficial for managing diabetes. The long-term result of this project is that patients and providers now have additional information regarding evidence-based recommendations regarding self-management strategies for diabetics.

Chapter 3 builds on the information presented in Chapters 1 and 2. Chapter 3 focuses on the organization and implementation of the quality improvement project. This chapter will evaluate the following: the project's methodology, needs assessment, design, data collection, analysis, resources, budget, timeline, and the protection of human subjects.

Purpose

This DNP project's purpose was to provide a further understanding of a focused educational session and implementation of self-management strategies. This project specifically examined the effects of a focused educational session on the frequency of blood glucose monitoring. Historically there has been inconclusive evidence in routinely monitoring blood glucose in adult noninsulin-dependent type II diabetics (Farmer et al., 2012; George et al., 2015; Harashima et al., 2016; Isaksson et al., 2015).

Project Design

The design for this DNP quality improvement project was a quantitative correlational design, examining the relationship between routinely monitoring blood glucose and a focused educational session. The questionnaire examined the participant's demographics, diabetes status, and the frequency of blood glucose monitoring. For this study, a pre- and postquestionnaire was utilized. There were two parts to the prequestionnaire. The first part consisted of questions evaluating frequency of blood glucose monitoring. The second part of the questionnaire was the Diabetes Self-Management Questionnaire. This questionnaire gathered additional information regarding self-management interventions. The pre- and postquestionnaire were identical to obtain inferences regarding the intervention of focused education. Inferences were obtained through statistical analysis of the raw data. Participants were selected using a convenience and snowballing sampling method from online support groups. Convenience and snowball sampling were performed through online postings, describing the study and asking for volunteers. Additional participants were obtained through snowballing, allowing the study to reach additional participants. An online format was utilized for recruitment and participation, reducing face-to-face interactions and protecting potential participants related to the current COVID-19 pandemic. Invitation participants were informed that they could invite others to participate. Participants were instructed to message their interest in participating. Potential participants were then emailed a link to the study where they read through the consent and then consented if they were eligible for the study and that they consented to participate.

Instruments and Measurement Tools

A pre- and postquestionnaire was utilized to gather data for the project. The prequestionnaire consisted of questions determining eligibility and evaluating the current

frequency of monitoring. The second part of the questionnaire consisted of the Diabetes Self-Management Questionnaire (DSMQ).

The DSMQ has four analyzed domains: glucose management, dietary control, physical activity, healthcare use, and sum scale. The sum scale is a global measure of self-care. The DSMQ was developed at the Research Institute of Diabetes Academy Mergentheim. Originally this questionnaire was developed in Germany but was converted to English translation following forward and backward translation. This questionnaire is applicable to both type I and II diabetics in adults. Participants were asked to rate each behavior on a Likert scale. Scoring the participants' responses used a sum of scores and theoretical maximum scores and subtracting those scores marked nonapplicable. The DSMQ questionnaire has been evaluated for consistency and reliability. The overall internal consistency was found to be .84, and each subscale showed acceptable constancy as well. Reliability has been established for this questionnaire (Schmitt et al., 2013).

The outcome of implementing the questionnaires was to develop a further understanding of how a focused diabetic educational session was affected by routinely monitoring blood glucose levels. The current literature was inconclusive regarding the benefits of routinely monitoring blood glucose levels in noninsulin-dependent type II diabetics (Farmer et al., 2012; George et al., 2015; Harashima et al., 2016; Isaksson et al., 2015).

Methodology Appropriateness

A correlational study design enabled a statistical analysis to be conducted, providing further support for the study's outcomes. Convenience and snowballing sampling were not ideal because of the increased probability of bias. However, for this DNP's project purposes and time constraints, it enabled an adequate sample size for statistical analysis. Data analysis was

conducted examining the frequency of monitoring blood glucose pre- and posteducation. Participants were obtained through an online diabetes support group. Approval was obtained through the group administrator. A posting was made in the group offering free diabetes education for participants in a diabetes educational study. Potential participants were instructed to message their interest in the study. Potential participants were then emailed the link to the study, where they were given the eligibility criteria for the study and determined their eligibility (see Appendix E). Potential participants were also provided the consent. The potential participants were instructed to only consent if they met the eligibility requirements. The participants then answered the prequestionnaire questions and were instructed to watch the educational recording after completing the questions. After a period, the participants were then instructed to complete the postquestionnaire study. The results from the study were then analyzed for statistical inferences.

Feasibility and Appropriateness

The DNP project was implemented in an online diabetes support group. This project was implemented online to reduce face-to-face contact to reduce the spread of COVID-19. Microsoft Forms questionnaire was utilized to create the surveys. This method of questionnaires was implemented to keep the participants' responses anonymous. There are no associated costs with implementing this DNP project. Arrangements were made for utilizing the online diabetes support groups for the implementation of the DNP project. Approval was obtained from multiple diabetes support groups (see Appendix F). The current organizational arrangements were found to be adequate to support the project development and implementation.

Institutional Review Board Approval and Process

The online diabetes support groups did not have an institutional review board (IRB). Institutional review board approval was obtained through Abilene Christian University (see Appendix H). Institutional review board training was completed by Jennifer Young. Institutional review board training was completed in 2021 and will be renewed yearly.

Interprofessional Collaboration

There were several stakeholders involved in this DNP project development. Interprofessional collaboration occurred between the stakeholders involved in this project and me as the researcher. A stakeholder in this project was the administrators of the diabetes support groups. The administrators were invested in the development and growth of their community. They are invested in what members they allow into their groups to create a safe community for individuals with diabetes. They were considered stakeholders in this project as they were the ones who approved the implementation of the project in their support groups, therefore, allowing access to the members of the community. Collaboration with these stakeholders was maintained through updates regarding the project and providing valid information for the members to participate in. Collaboration will also be maintained between the chair and committee members. The chair and committee members were also stakeholders in the project as they were involved in developing the project for successful implementation. Thorough communication was maintained with all stakeholders to improve collaboration between members.

Practice Setting for Evidenced-Base Practice

The recruitment setting for this DNP project was through multiple online diabetes support groups. This setting was selected for implementing this project because of its feasibility to implement the project. Another reason this setting was selected was to examine the target

population: adults who had type II diabetes and were not insulin-dependent. This setting enabled a more diverse sample population. An online format was also selected to reduce face-to-face interaction and protect potential participants related to the current COVID-19 pandemic.

Target Population

The target population for this DNP project was adult type II diabetics who were not insulin-dependent. The study participants were adults between the ages of 18 to 64 who had been diagnosed with type II diabetes. Exclusion criteria for participating in the DNP project were individuals who had only been diagnosed with prediabetes and patients with type II diabetes taking insulin. Other exclusion criteria for participation in the study were individuals diagnosed with dementia, were deemed incompetent, or were pregnant.

Risks

The potential risk from participating in this DNP project was the potential for a breach of confidentiality. Measures were implemented to secure survey results to protect against a breach of privacy by providing anonymous data results. Another potential risk participants may experience was potentially being uncomfortable or emotionally upset regarding the survey content. Some participants may find the survey questions regarding income, education, demographics, and perceptions upsetting. The survey was designed with a neutral tone to combat the potential risk to participants.

Benefits

A potential benefit to participating in this DNP project was an increased awareness and understanding of how to implement blood glucose monitoring. The data collected from this study provided additional information to healthcare personnel with additional evidence supporting the

self-management intervention of routinely monitoring blood glucose in the adult noninsulin-dependent type II diabetic patient population.

Data Collection and Management

Data was collected through a Microsoft Forms questionnaire. Informed consent was obtained through a disclaimer prior to beginning the prequestionnaire. Participants were given access to the consent. After the educational session, a postquestionnaire was administered via email by Microsoft Forms questionnaire. The results were then analyzed. Email addresses were stored in a password secured email on a password secured desktop in a locked office.

Timeline

The initial phases of the project constituted establishing its framework. The project's framework constituted creating Chapters 1 through 3 and obtaining permission to utilize the questionnaires. Once permission had been obtained, the questionnaires were uploaded to the Microsoft Forms questionnaire for the pre- and postquestionnaires. Institutional review board training certification was completed, and approval was obtained. Permission had been obtained from Abilene Christian University's IRB.

The second phase of the project was implementation, in which the project was implemented and generated. Postings were posted on multiple online diabetes support groups. The recruitment period lasted several weeks. Participants were given informed consent and eligibility requirements prior to initiating the project. After reviewing the informed consent, participants completed the prequestionnaire. The prequestionnaire provided a baseline for the project implementation. The educational session was prerecorded and available through the sway classroom. After a period, a postquestionnaire was administered. Table G1 provides a table timeline of the project (see Appendix G).

Analysis Plan

Quantitative measures were utilized to draw inferences from the data collected. Statistical Package for the Social Sciences software provided by Abilene Christian University was utilized to perform the following statistical analysis of the data. A one-way analysis of variance (ANOVA) was used for categorically independent variables that are normally distributed. A chi-square test was utilized to examine the strength of association. The Mann-Whitney U test was used for the not normally distributed data.

Chapter Summary

Chapter 3 provided the reader with an understanding of the implementation process of this DNP project. The chapter outlined the project's purpose and discussed the implementation of the different phases of the project. This chapter also provided the reader with a clear understanding of the project's setting and the target population for the project. Giving the reader a clear understanding of the design of the DNP project enables other researchers to establish its reproducibility and validity of results.

Chapter 4: Findings

Chapter 1 described the importance of a focused educational session for blood glucose management. Chapter 2 examined the existing literature regarding a focused diabetes academic session and self-management. Chapter 3 outlined the organization, methodology, and quality improvement project implementation. The DNP project aimed to evaluate the effects of a focused diabetes educational session and its impact on the frequency of monitoring blood glucose. This project aimed to evaluate the efficacy of a focused diabetes education course discussing the self-management intervention of routinely monitoring blood glucose and increasing the frequency of monitoring. The findings from this project enabled providers to recommend the self-management of monitoring blood glucose for this patient group, which is beneficial in managing diabetes. The long-term result of this project was that patients and providers have additional studies supporting the evidence-based recommendations regarding self-management strategies for diabetics.

Chapter 4 will analyze the question and examine the data collected from the implementation of this DNP project. Chapter 4 will also offer an interpretation of the data collected and further discuss the findings obtained from this project to guide individuals and providers in evidence-based self-management strategies.

Purpose of the Project

This DNP project aimed to understand further a focused education session and to implement self-management strategies. This project specifically examined the effects of a focused educational session on the frequency of blood glucose monitoring. Historically there has been inconclusive evidence in utilizing the self-management strategy of blood glucose monitoring in noninsulin-dependent diabetics (Farmer et al., 2012: George et al., 2015;

Harashima et al., 2016; Isaksson et al., 2015). The data gathered from the study added to the previously established information collected regarding the self-management of type II diabetics that are not insulin-dependent.

This DNP project was a quality improvement project with a quantitative correlational design. The goal was to examine the relationship between routinely monitoring blood glucose and a focused educational session. A pre- and postquestionnaire was utilized. Participants were selected using convenience and snowball sampling methods from online support groups. Convenience and snowball sampling were performed through online postings, describing the study and asking for volunteers. For this quality improvement project, an online format was utilized for recruitment and participation. This reduced face-to-face interactions and protected potential participants related to the current COVID-19 pandemic. Participants were instructed to message their interest in participating. Potential participants were then emailed a link to the study to read through the consent. Participants would then consent to participate and were eligible to participate in the study.

An identical pre- and postquestionnaire were utilized to gather inference regarding implementing a focused diabetes educational session. The questionnaires included information regarding eligibility, the current frequency of monitoring, and the Diabetes Self-Management Questionnaire (DSMQ). The DSMQ has four domains being analyzed: glucose management, dietary control, physical activity, healthcare use, and a sum scale. The sum scale is a global measurement of overall self-care evaluation.

The total number of participants initially approved for screening and enrollment was 195 individuals. One hundred ninety-five participants were screened, and 12 participants were enrolled in the quality improvement project. Nine completed the postquestionnaire of the 12

participants who completed the prequestionnaire and educational session. There were no participants that had withdrawn or withdrew from the quality improvement project. The participants in the study were primarily 50–59 years of age (33.3%), followed by 18–29-year-olds (25%) and 10–49-year-olds (25%).

Demographics

The targeted population for this study was adults who had type II diabetes and were not currently receiving insulin therapy. This is the targeted population of focus for this DNP quality improvement project because of the conflicting recommendations for monitoring blood glucose. The self-management recommendation for the type II noninsulin-dependent diabetic was inconclusive in recommendations for this patient group. The exclusions for participating in this quality improvement were prediabetes and insulin resistance. Recommendations for blood sugar monitoring were not recommended unless experiencing hypoglycemic episodes in prediabetes and insulin resistance. Individuals with gestational diabetes were also excluded from the target population related to additional monitoring requirements related to pregnancy. Individuals currently taking insulin therapy were excluded from this patient population. There are well-established guidelines and recommendations for monitoring blood glucose in that patient population.

The targeted location for implementing this quality improvement project was online. The online design was selected to reduce face-to-face interaction during the current COVID-19 pandemic. Online diabetes support groups were chosen through Facebook and online social platform. For this quality improvement project, this platform was used to reach a large population base to increase the number of study participants. A search for type II diabetes support groups was implemented. Groups were approached based on their group purpose and

goals. Support groups were excluded if they primarily focused on meal plans and recipes. Other groups were excluded based on if they mainly focused on gestational diabetes or type I diabetes. Seven groups were selected for member participation in this quality improvement study. Those groups were defeating type 1 and type 2 diabetes, herbs for diabetes, reversing type 2 diabetes, diabetes support group, diabetes awareness/reversing it, type 2 diabetes control, and type 1 and 2 diabetes. Administrators of each group were contacted for approval (defeating type 1 and type 2 diabetes; herbs for diabetes; reversing type 2 diabetes; diabetes support group; diabetes awareness/reverse it: type 2 diabetes control; type 1 and 2 diabetes).

The total number of potential participants for this quality improvement project was 195. Of the 195 potential participants, only 12 completed the prequestionnaire (see Table 1). Of the 195 participants, only nine completed the entire quality improvement project, which consisted of both the pre- and postquestionnaires. The percentage participating in the prequestionnaire was 6.15%. The rate of participating in the pre- and postquestionnaire was 4.61%. Of the nine participants of the postquestionnaire, only one participant completed the postquestionnaire and not the prequestionnaire.

Table 1

Participants

	Prequestionnaire	Postquestionnaire
Total	12	9
Excluded:	7	4
• Only completed prequestionnaire	3	
• Insulin dependent	4	2
• Only completed postquestionnaire		2

The age ranges of those who participated were broken down into six categories. Four of the 12 individuals that participated in the prequestionnaire (33.3%) were 50 to 59-years of age, three participants (25%) were 66 and older, three participants (25%) were 40 to 49-years of age, one participant (8.3%) were 18 to 29-years of age, and one participant (8.4%) were 30 to 39-years of age. In the postquestionnaire, nine individuals participated with four participants (44.4%) aged 50–59 years of age, three participants (33.3%) were 66 years of age, one participant (11.1%) were between the ages of 30 and 39 years of age, and one participant (11.1%) were between the ages of 40–49 years of age. From the pre- and postquestionnaires, different age percentiles were noted between the two questionnaires. Of the 12 individuals that responded to the prequestionnaire, 11 participants, 91.7%, were diagnosed with diabetes, and one participant, 8.3%, was diagnosed with prediabetes. Those participants that selected prediabetes did not participate in the postquestionnaire. Of the nine participants who completed the post questionnaire, 100% were diagnosed with diabetes.

The third question evaluated the individual's current treatment plan. Multiple choice was enabled. Of the 12 individuals that participated in the prequestionnaire, eight participants (66.7%) stated their treatment plan consisted of tablets, followed by lifestyle interventions with five participants (41.7%). Insulin therapy was noted for four of the participants (33.3%), and noninsulin injections were reported for one participant (8.3%). There was also a noted difference between the responses for the pre- and postquestionnaire for this question. A significant number of participants took tablets, seven participants (77.8%). Lifestyle changes also increased in the postquestionnaire; five participants at 55.6%, and five participants in the prequestionnaire at 41.7%. Insulin therapy was noted to decrease; two participants at 22.2%, and four participants at

33.3%. Noninsulin injections were also reported to increase with one participant at 11.1% from one participant at 8.3%.

Participants were also allowed to multiple select their treatment regime, and three participants selected that their treatment plan consisted of lifestyle changes, insulin therapy, and tablets. Two participants selected a combination of two: lifestyle changes, tablets, insulin therapy, and noninsulin injections. Two participants selected lifestyle changes alone, while two others selected insulin therapy. Three participants from the prequestionnaire chose tablets alone. One participant in the postquestionnaire selected lifestyle changes, insulin therapy, and tablets. Three of the participants in the postquestionnaire selected lifestyle changes and tablets. One participant selected tablets and noninsulin injections. Two of the participants selected tablets alone. Two other participants selected either insulin therapy alone or lifestyle changes alone.

The fourth question evaluated whether the individuals participating had received diabetic education. Of the 12 individuals that participated, five participants (47.1%) stated that they had never received any diabetic education. After a focused education session, this was noted to increase postquestionnaire to four participants (44.4%). Of the initial 12 participants, four participants (33.3%) selected that they received diabetic education five-plus years ago, which was consistent in the postquestionnaire with three participants (33.3%). Of the individuals who participated in the prequestionnaire, two participants (16.7%) received diabetic education one to two years ago. In contrast, in the postquestionnaire, this was noted to decrease to one participant (11.1%). One participant (8.3%) in the prequestionnaire selected that they received diabetic education four to five years ago. Of the individuals participating in the prequestionnaire, no one selected receiving education less than a year ago, whereas one participant (11.1%) selected this option in the postquestionnaire group.

The fifth question evaluated what type of education the individuals received. This question enabled participants to select as many as applied. Of the 12 individuals responding to the prequestionnaire, one participant received education from all categories: nurse provided, primary provider education, nutritionist, handouts, face-to-face, and a diabetes class. One participant in the prequestionnaire selected receiving education from a nutritionist, handouts, face-to-face, and a diabetes class. Another participant in the prequestionnaire group selected receiving nurse education, primary provider education, and handouts. Other participants of the prequestionnaire selected an arrangement of two of the following: nurse provided, primary provider, face-to-face, and nutritionist. Five of the 12 chosen participants did not receive any education. One participant selected that they received education from a nutritionist. Of the nine participants in the postquestionnaire, two participants selected that they received education from a nurse, primary provider, and nutritionist. One postquestionnaire participant selected that they received education from a nutritionist, face-to-face, and a diabetes class. One participant selected that they received education from a nurse along with handouts. Three of the nine participants selected did not receive any education. Two participants selected they followed a primary provider or a nutritionist.

The questionnaires' sixth question evaluated how often the individual's healthcare provider recommended monitoring blood glucose. Four participants (33.3%) in the prequestionnaire selected that they were recommended to monitor their blood glucose once a day. This was noted to decrease in the postquestionnaire to two participants (22.2%). In the prequestionnaire, three participants (25%) were recommended to monitor their blood sugar three times a day; this decreased to two participants (22.2%) in the postquestionnaire. In the prequestionnaire, three participants (25%) indicated that they did not receive any

recommendation to monitor their blood sugar and decreased to two participants (22.2%) in the postquestionnaire. In the prequestionnaire, one participant (8.3%) was recommended to monitor their blood sugar over four times a day, which increased to two participants (22.2%) in the postquestionnaire. In the prequestionnaire, one participant (8.3%) selected that they were recommended to monitor their blood sugar daily, which increased to three participants in the postquestionnaire (11.1%).

The seventh question evaluated how often the participants monitored their blood sugar. Of the 12 individuals participating in the prequestionnaire, three participants (25%) reported monitoring their blood sugar twice a day; this decreased in the postquestionnaire to one participant (11.1%). Three participants (25%) in the prequestionnaire also selected monitoring their blood sugar daily; this remained the same in the postquestionnaire, with three participants (33.3%) responding. In the prequestionnaire group, three participants (25%) responded that they never checked their blood sugar. This decreased to one participant (11.1%). Two (16.7%) of the 12 participants in the prequestionnaire reported checking their blood sugar three times a day. This decreased to one participant (11.1%) in the postquestionnaire. One participant (8.3%) of the 12 participants selected that they checked their blood sugar over four times per day. This increased to three participants (33.3%) in the postquestionnaire.

The eighth question evaluated how often the participants checked their blood sugar levels with care and attention. Of the 12 participants, six participants (50%) reported that checking their blood sugar levels with care and attention did apply to them very much, which decreased in the postquestionnaire to three participants (33.3%). In the prequestionnaire, four participants (33.3%) indicated that checking their blood sugar with care and attention applied to them to some degree, which remained the same with four participants (44.4%) in the postquestionnaire.

One participant (8.3%) in the prequestionnaire group selected that blood sugar monitoring was not part of their treatment group. Another participant (8.3%) in the prequestionnaire group selected that checking their blood sugar with care and attention did not apply to them, which remained the same in the postquestionnaire group with one participant (11.1%).

The ninth question assessed food choices and obtaining optimal blood sugar levels. Of the 12 participants of the prequestionnaire, four participants (33.3%) selected that food choices did not apply to them. This decreased to one participant (11.1%) in the postquestionnaire group. Three participants (25%) in the prequestionnaire group selected that food choices applied to them very much, which decreased to one participant (11.1%). Two participants (16.7%) selected that food choices applied to them a considerable degree, which increased to three participants (33.3%) in the postquestionnaire. Three participants (25%) in the prequestionnaire selected that food choices applied to them to some degree, which increased to four participants (44.4%) in the postquestionnaire.

The 10th question evaluated maintaining regular doctor appointments. Of the 12 participants of the prequestionnaire, 10 participants (83.3%) indicated that they hold their appointments. This decreased to five participants (55.6%) in the postquestionnaire. One participant (8.3%) indicated that this applied to them to a considerable degree, which increased to four participants (44.4%) in the postquestionnaire. One participant (8.3%) indicated that this only applied to them to some degree in the prequestionnaire.

The 11th question evaluated whether individuals took their medications as prescribed. Of the 12 participants in the prequestionnaire, six participants (50%) indicated that taking their medications as prescribed applied to them very much, which decreased to four participants (44.4%) in the postquestionnaire. Three participants (25%) indicated that taking their

medications as prescribed applied to them to some degree. This decreased to two participants (22.2%) in the postquestionnaire. Two participants (16.7%) indicated that medications were not a part of their treatment plan, which decreased to one participant (11.1%) in the postquestionnaire group. One participant (8.3%) indicated that taking their medications as prescribed applied to them a considerable amount. This increased to two participants (22.2%) in the postquestionnaire section.

The 12th question evaluated whether individuals ate lots of sweets or carbohydrate-rich foods. Of the 12 individuals participating in the prequestionnaire, five participants (41.7%) believed that they, to some degree, ate sweets or carbohydrate-rich foods. This decreased to four participants (44.4%) in the postquestionnaire. One participant (8.3%) believed that eating a lot of sweets or carbohydrate-rich foods did not apply to them, which increased to two participants (22.2%) in the postquestionnaire. Five participants (41.7%) in the prequestionnaire believed that eating sweets or rich carbohydrates did apply to them very much. This decreased to three participants (33.3%) in the postquestionnaire group. One participant (8.3%) believed that eating sweets and carbohydrates greatly applied to them.

The 13th question evaluated whether individuals recorded their blood sugar levels regularly. Of the 12 individuals participating in the prequestionnaire, five participants (41.7%) believed that they checked their blood sugars to some degree on a regular level. This decreased to three participants (33.3%) in the postquestionnaire. In the prequestionnaire, three participants (25%) selected that checking their blood sugar did not apply to them. This decreased to two participants (22.2%) in the postquestionnaire. Two of the participants (16.7%) reported that checking their blood sugar regularly did apply to them very much. This increased to three participants (33.3%) in the postquestionnaire. In the prequestionnaire, one participant (8.3%)

believed that checking their blood sugar regularly applied to them to a considerable degree. This remained the same in the postquestionnaire, with 11.1%. In the prequestionnaire, one participant (8.3%) selected that their blood sugar measurement did not apply to their treatment.

The 14th question assessed whether individuals tended to avoid diabetes-related doctors' appointments. In the prequestionnaire 10 participants (83.3%) stated that avoiding diabetes-related doctors' appointments did not apply to them. This decreased to seven participants (77.8%) in the postquestionnaire. Two participants (16.7%) in the prequestionnaire reported that avoiding diabetes-related doctors' appointments did apply to them. This decreased to one participant (11.1%) in the postquestionnaire. In the postquestionnaire, one participant (11.1%) indicated that avoiding diabetes-related doctors' appointments applied to them very much.

The 15th question evaluated whether individuals utilized physical activity for optimal blood sugar levels. In the prequestionnaire, seven participants (58.3%) reported that regular physical activity did not apply to them to achieve optimal blood sugar levels. In the postquestionnaire, this decreased to two participants (22.2%). In the prequestionnaire, three participants (25%) indicated that physical activity did apply to them to some degree. This increased to seven participants (77.8%) in the postquestionnaire. In the prequestionnaire, two participants indicated that regular physical activity did apply to them to a considerable degree.

The 16th question evaluated whether individuals strictly followed their diet recommendations. In the prequestionnaire, five participants (41.7%) indicated that dietary recommendations did not apply to them. This decreased to three participants (33.3%) in the postquestionnaire. In the prequestionnaire, three participants (25%) indicated that following dietary recommendations were applied to them to a considerable degree. This decreased to two participants (22.2%) in the postquestionnaire. In the prequestionnaire, four participants (33.3%)

noted that following dietary recommendations applied to them to some degree. This increased to four participants (44.4%) in the postquestionnaire.

The 17th question evaluated whether individuals monitored their blood sugar levels frequently enough to obtain optimal blood glucose control. In the prequestionnaire, five participants (41.7%) indicated to some degree that they did not check their blood sugar frequently enough. This decreased to one participant (11.1%) in the postquestionnaire. Four participants (33.3%) in the prequestionnaire indicated that their blood sugar did not apply to them. This increased to five participants (55.6%) in the postquestionnaire group. Two participants in the prequestionnaire indicated that not checking their blood sugar frequently did apply to them very much, which was the same in the postquestionnaire group at 22.2%. In the prequestionnaire group, one participant (8.3%) indicated that blood sugar measurement was not a required part of their treatment plan. In the postquestionnaire group, one participant (11.1%) indicated that not checking their blood glucose levels frequently enough applied to them to a considerable degree.

The 18th question assessed whether individuals avoided physical activity. Of the 12 individuals participating in the prequestionnaire, eight participants (66.7%) indicated that to some degree they avoided physical activity even though it would improve their diabetes. This decreased to four participants (44.4%) in the postquestionnaire group. In the prequestionnaire group, three participants (25%) indicated that avoiding physical activity applied to them very much. This decreased to two participants (22.2%) in the postquestionnaire group. In the prequestionnaire group, 8.3% of participants indicated that avoiding physical activity applied to them to a considerable degree. In the postquestionnaire group of three participants, 33.3% indicated that this question did not apply to them.

The 19th question evaluated whether individuals forgot or skipped their medications. In the prequestionnaire group participants, 66.7% indicated that forgetting or skipping their medications did not apply to them. This decreased to five participants (55.6%) in the postquestionnaire. In the prequestionnaire three participants (25%) indicated that forgetting or skipping their medications did apply to them to some degree. This increased to four participants (44.4%) in the postquestionnaire group. In the prequestionnaire group, one participant (8.3%) indicated that forgetting to take their medications or skipping them applied to them to a considerable degree.

The 20th question evaluated whether individuals had food binges. Of the 12 participants, five participants (41.7%) indicated that having food binges did apply to them to some degree. This decreased to one participant (11.1%) in the postquestionnaire group. Two participants (16.7%) in the prequestionnaire group indicated that having food binges did not apply to them. This increased to 33.3% in the postquestionnaire group. Two participants (16.7%) in the prequestionnaire group indicated that having food binges applied to them very much. This was the same in the postquestionnaire group at 22.2%. In the prequestionnaire group, three participants (25%) indicated that having food binges applied to them to a considerable degree. This increased to three participants (33.3%) in the postquestionnaire group.

The 21st question evaluated whether individuals believed they should see their primary care providers more often. Of the 12 participants in the prequestionnaire group, eight participants (66.7%) indicated that needing to see their medical practitioner more often did not apply to them. This decreased to five participants (55.6%) in the postquestionnaire group. Four participants in the prequestionnaire group (33.3%) indicated that, to some degree, they should see their medical

practitioner more often. This increased to four participants (44.4%) in the postquestionnaire group.

The 22nd question evaluated whether individuals skipped physical activity. Seven individuals (58.3%) indicated that they skipped planned physical activity to some degree. This decreased to four participants (44.4%) in the postquestionnaire group. In the prequestionnaire, four participants (33.3%) indicated that they tended to skip planned physical activity very much. This decreased to three participants (33.3%) in the postquestionnaire group. One participant (8.3%) in the prequestionnaire group indicated that skipping planned physical activity applied to them to a considerable degree; this remained the same in the postquestionnaire group at 11.1%. In the postquestionnaire group, one participant (11.1%) indicated that skipping planned physical activity did not apply to them.

The 23rd question evaluated whether individuals believed that their self-care was poor regarding their diabetes. Four participants (33.3%) in the prequestionnaire group indicated that their diabetes self-care was poor and applied to them very much. This decreased to one participant (11.1%) in the postquestionnaire group. Three participants (25%) in the prequestionnaire group indicated that their diabetes self-care was poor to a considerable degree. This decreased to one participant (11.1%) in the postquestionnaire group. In the prequestionnaire group, two participants (16.7%) indicated that their diabetes self-care was poor to some degree. This increased to six participants (66.7%) in the postquestionnaire group. Three participants (25%) in the prequestionnaire group indicated that diabetes self-care did not apply to them. This decreased to one participant (11.1%) in the postquestionnaire group.

Table 2 breaks down each question and the number of pre- and postquestionnaire responses.

Table 2

Participant Responses to the Pre- and Postquestionnaires

Questions	Prequestionnaire (*n* = 12) Number of responses	Postquestionnaire (*n* = 9) Number of responses
What is your age group?		
• 18–29	1	0
• 30–39	1	1
• 40–49	3	1
• 50–59	4	4
• 60–65	0	0
• 66 and older	3	3
I have been diagnosed with the following:		
• Prediabetes	1	0
• Gestational diabetes	0	0
• Diabetes	11	9
• Insulin resistance	0	0
Does my current treatment plan consist of the following?		
• Lifestyle changes, insulin therapy, and tablets	1	1
• Lifestyle changes and tablets	2	3
• Insulin therapy and tablets	1	
• Tablets and noninsulin injections	1	1
• Lifestyle changes	2	1
• Insulin therapy	2	1
• Tablets	3	2
Have you ever received diabetic education?		
• Never	5	4
• Less than a year ago	0	1
• 1–2 years ago,	2	1
• 4–5 years ago,	1	0
• 5+ years ago	4	3

Questions	Prequestionnaire (*n* = 12) Number of responses	Postquestionnaire (*n* = 9) Number of responses
What type of education did you receive?		
• The nurse provided primary provider education, nutritionist, handouts, face-to-face, diabetes class	1	0
• The nurse provided primarily provider education, nutritionist	0	2
• Nutritionist, handouts, face-to-face, diabetes class	1	0
• The nurse provided primary provider education, handouts	1	0
• The nurse provided primary provider education	1	0
• The nurse provided face-to-face	1	0
• The nurse provided handouts	0	1
• Nutritionist, face-to-face	1	
• Nutritionist, face-to-face, diabetes class	0	1
• None	5	3
• Nutritionist	1	1
• Primary provider education	0	1
How often did your healthcare provider recommend monitoring your blood glucose?		
• Never	3	2
• Daily	1	1
• Twice a day	4	2
• Three times a day	3	2
• Over four times a day	1	2
How often do you monitor your blood glucose?		
• Never	3	1
• Daily	3	3
• Twice a day	3	1

Questions	Prequestionnaire (*n* = 12) Number of responses	Postquestionnaire (*n* = 9) Number of responses
• Three times a day	2	1
• Over four times a day	1	3
I check my blood sugar levels with care and attention.		
• It applies to me very much	6	3
• Applies to me a considerable degree	0	1
• Applies to me some degree	4	4
• It does not apply to me	1	1
• Blood sugar monitoring is not required as part of my treatment	1	0
The food I choose to eat makes it easy to achieve optimal blood sugar levels.		
• It applies to me very much	3	1
• Applies to me a considerable degree	2	3
• Applies to me some degree	3	4
• It does not apply to me	4	1
I keep all doctors' appointments recommended for my diabetes treatment.		
• It applies to me very much	10	5
• Applies to me a considerable degree	1	4
• Applies to me some degree	1	0
• It does not apply to me	0	0
I take my diabetes medication (e.g., insulin, tablets as prescribed).		
• It applies to me very much	6	4
• Applies to me a considerable degree	1	2
• Applies to me some degree	3	2
• It does not apply to me	0	0

Questions	Prequestionnaire (*n* = 12) Number of responses	Postquestionnaire (*n* = 9) Number of responses
• Diabetes medication/insulin is not a required part of my treatment plan	2	1
Occasionally I eat lots of sweets or other food rich in carbohydrates.		
• It applies to me very much	5	3
• Applies to me a considerable degree	1	0
• Applies to me some degree	5	4
• It does not apply to me	1	2
I record my blood sugar levels regularly.		
• It applies to me very much	2	0
• Applies to me a considerable degree	1	1
• Applies to me some degree	5	3
• It does not apply to me	3	2
• Blood sugar measurement is not required as part of my treatment	1	0
I tend to avoid diabetes-related doctors' appointments.		
• It applies to me very much	0	
• Applies to me a considerable degree	0	0
• Applies to me some degree	2	1
• It does not apply to me	10	7
I do regular physical activity to achieve optimal blood sugar levels.		
• It applies to me very much	0	0
• Applies to me a considerable degree	2	0
• Applies to me some degree	3	7
• It does not apply to me	7	2

Questions	Prequestionnaire (*n* = 12) Number of responses	Postquestionnaire (*n* = 9) Number of responses
I strictly follow the dietary recommendations given by my doctor or diabetes specialist.		
• It applies to me very much	0	0
• Applies to me a considerable degree	3	2
• Applies to me some degree	4	4
• It does not apply to me	5	3
I do not check my blood sugar levels frequently enough, as would be required for achieving good blood glucose control.		
• It applies to me very much	2	2
• Applies to me a considerable degree	0	1
• Applies to me some degree	5	1
• It does not apply to me	4	5
• Blood sugar measurement is not required as part of my treatment	1	0
I avoid physical activity, although it would improve my diabetes.		
• It applies to me very much	3	2
• Applies to me a considerable degree	1	0
• Applies to me some degree	8	4
• It does not apply to me	0	3
I tend to forget to take or skip my diabetes medications.		
• It applies to me very much	0	0
• Applies to me a considerable degree	1	0
• Applies to me some degree	3	4
• It does not apply to me	8	5
• Diabetes medication/insulin is not a required part of my treatment plan	0	0

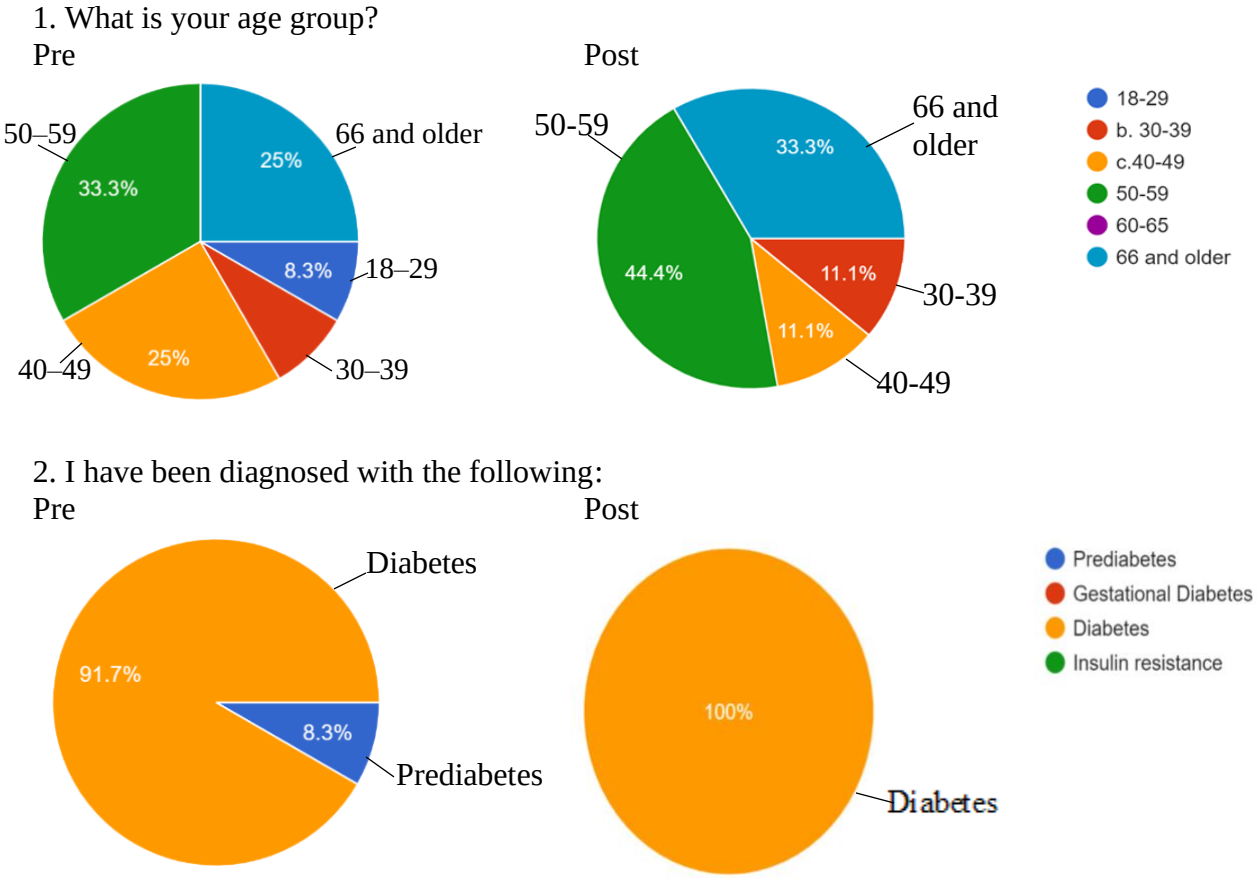
Questions	Prequestionnaire (*n* = 12) Number of responses	Postquestionnaire (*n* = 9) Number of responses
Sometimes I have real 'food binges.'		
• It applies to me very much	2	2
• Applies to me a considerable degree	3	3
• Applies to me some degree	5	1
• It does not apply to me	2	3
Regarding my diabetes care, I should see my medical practitioner(s) more often.		
• It applies to me very much	0	0
• Applies to me a considerable degree	0	0
• Applies to me some degree	4	4
• It does not apply to me	8	5
I tend to skip planned physical activity.		
• It applies to me very much	4	3
• Applies to me a considerable degree	1	1
• Applies to me some degree	7	4
• It does not apply to me	0	1
My diabetes self-care is poor.		
• It applies to me very much	4	1
• Applies to me a considerable degree	3	1
• Applies to me some degree	2	6
• It does not apply to me	3	1

Note. Data contains all responses including excluded participants.

Figure 1 provides graph comparisons of each question's pre- and postquestionnaire responses.

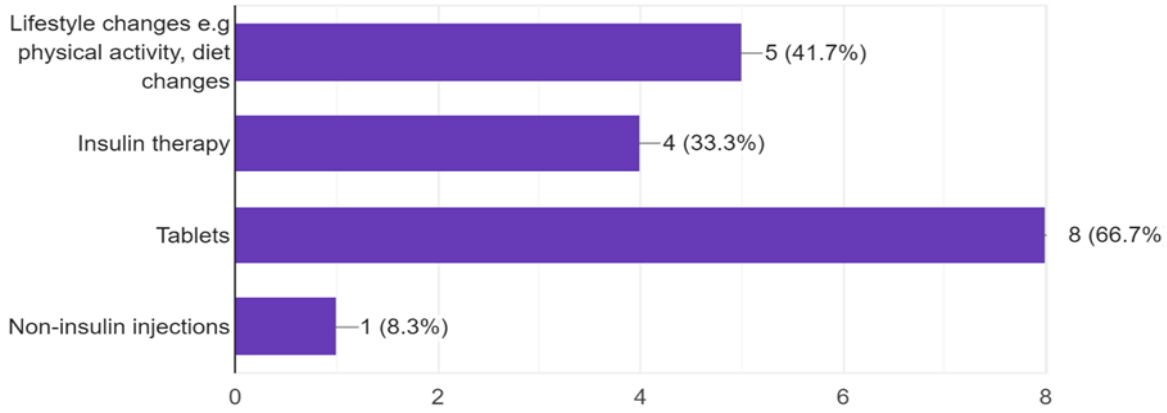
Figure 1

Graph Comparison of Pre- and Postquestionnaire Responses

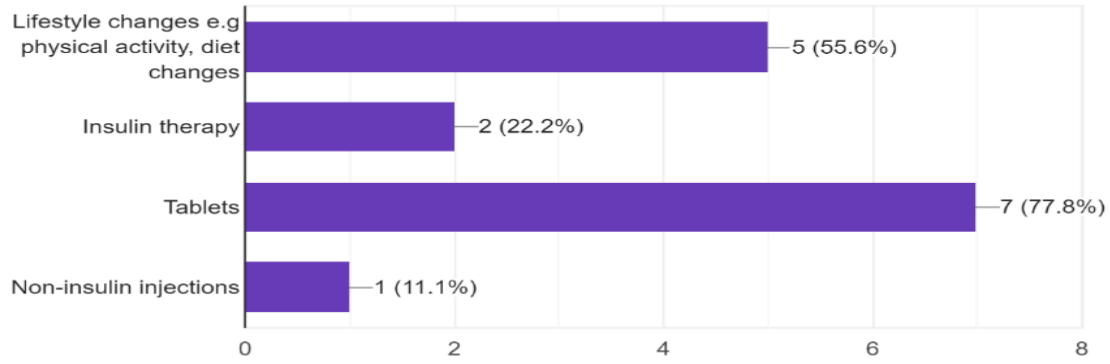


3. My current treatment plan consists of the following:

Pre

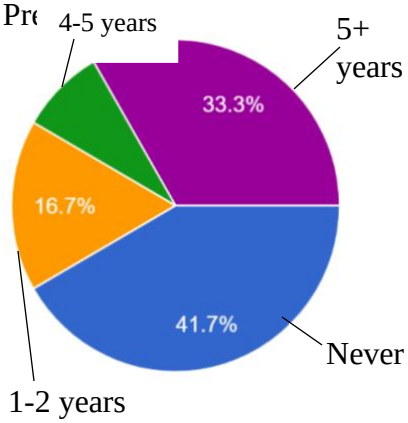


Post

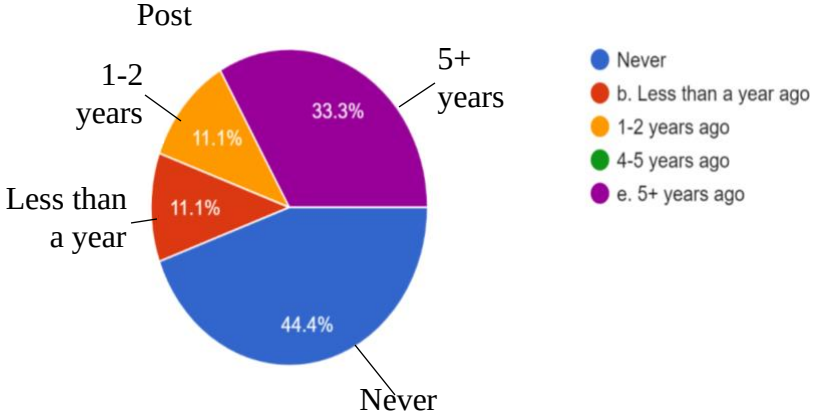


4. Have you ever received diabetic education?

Pre

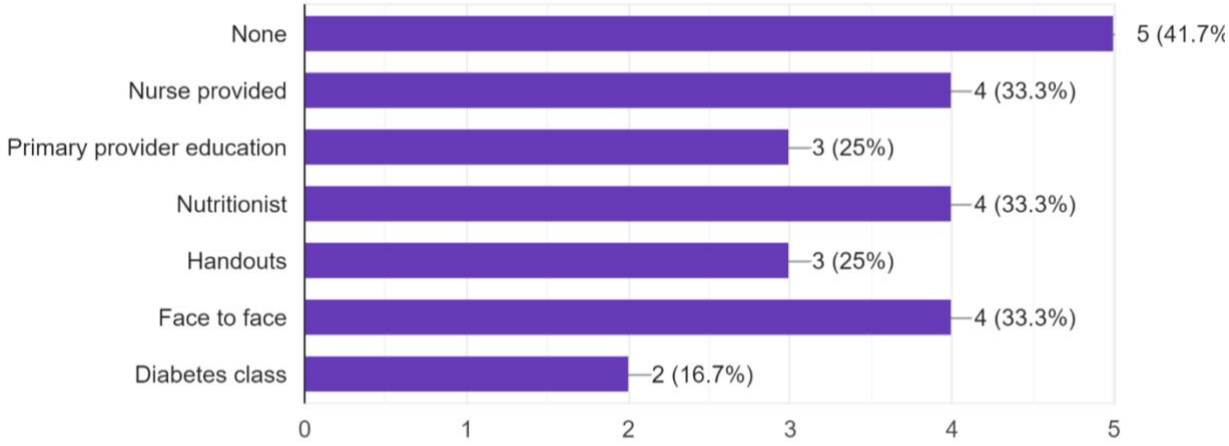


Post

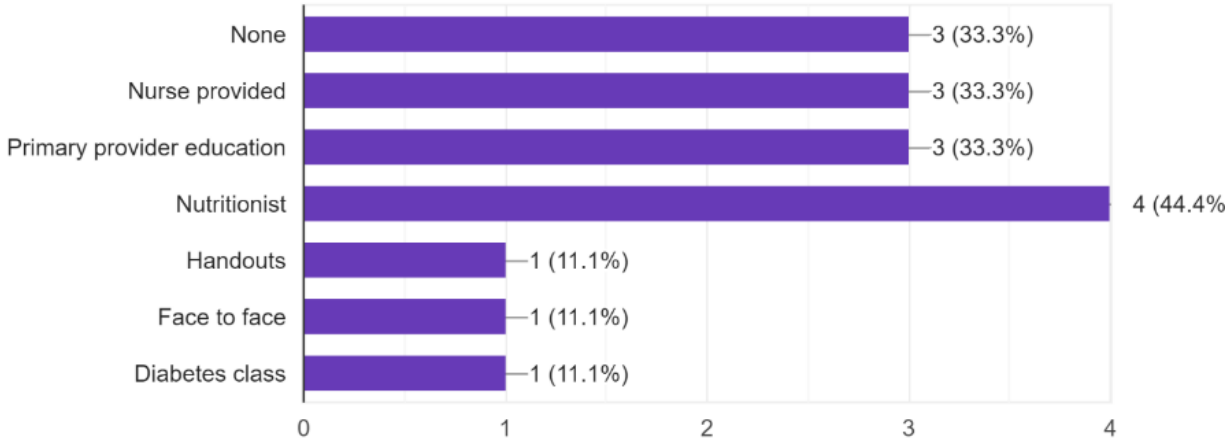


5. What type of education did you receive (select all that apply):

Pre

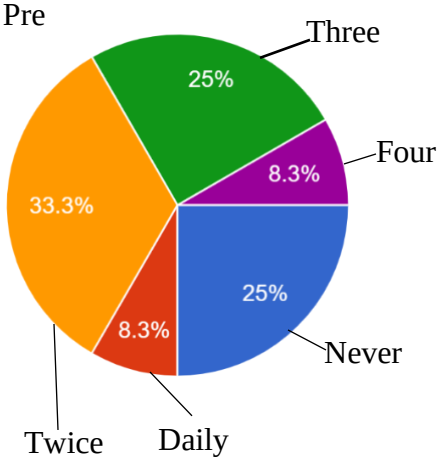


Post

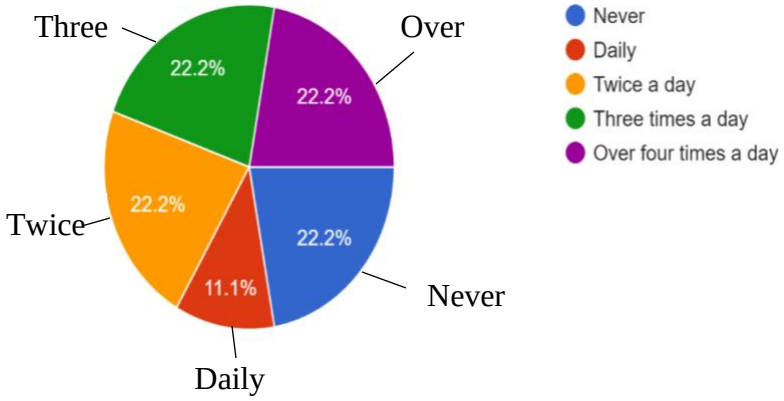


6. How often did your healthcare provider recommend monitoring your blood glucose?

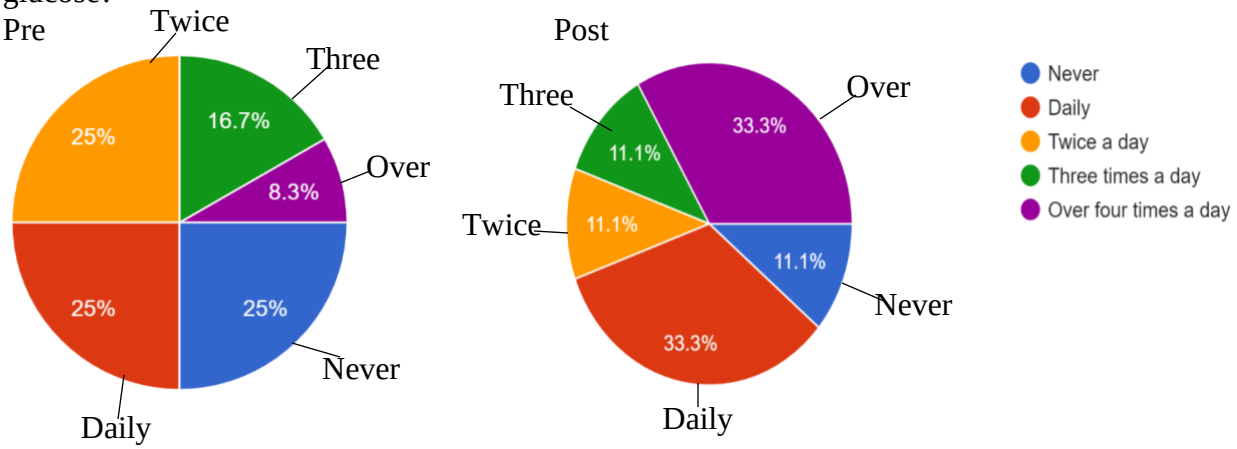
Pre



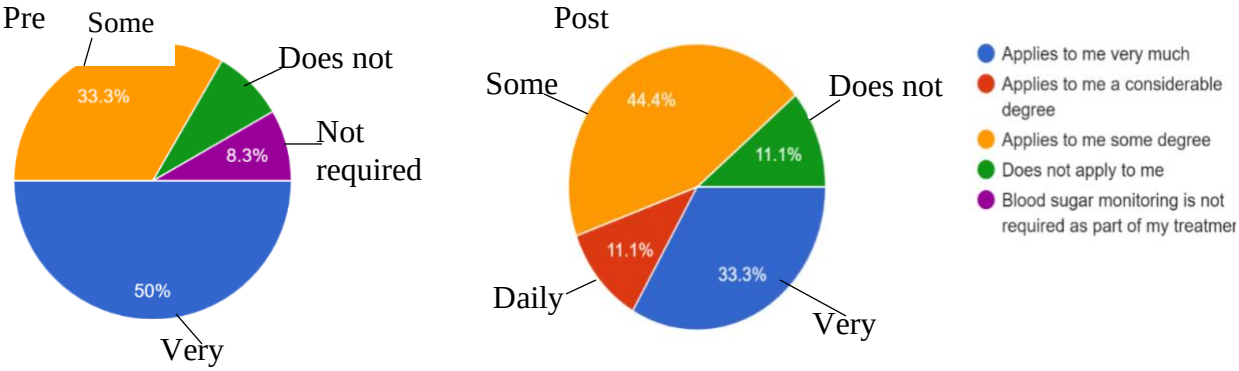
Post



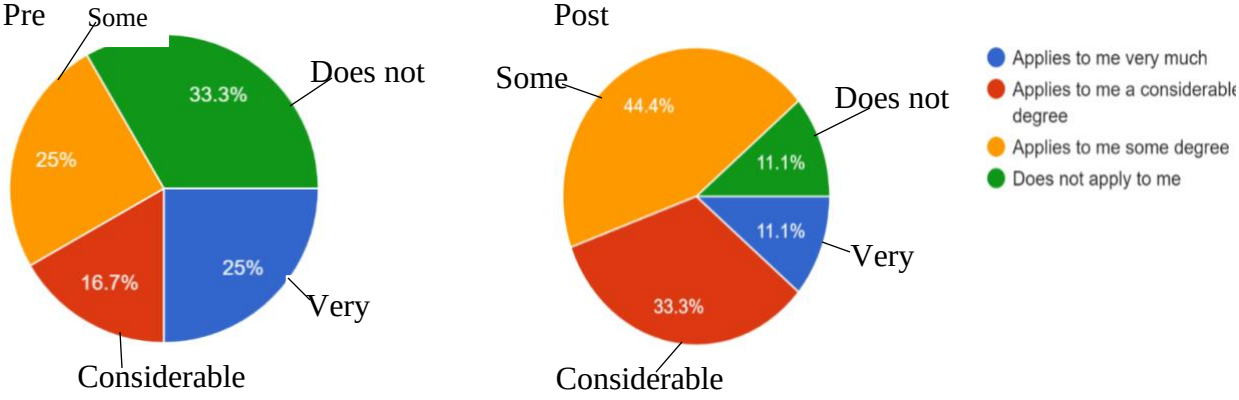
7. How often do you monitor your blood glucose?



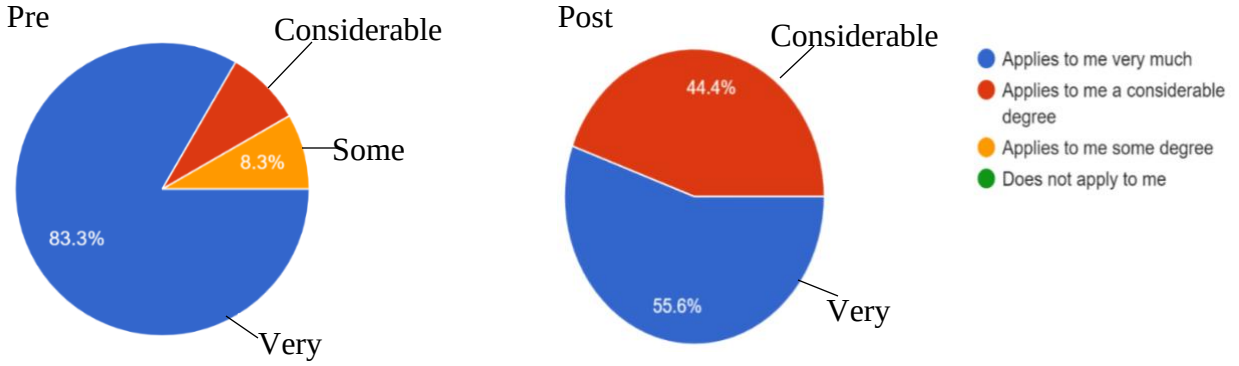
8. I check my blood sugar levels with care and attention.



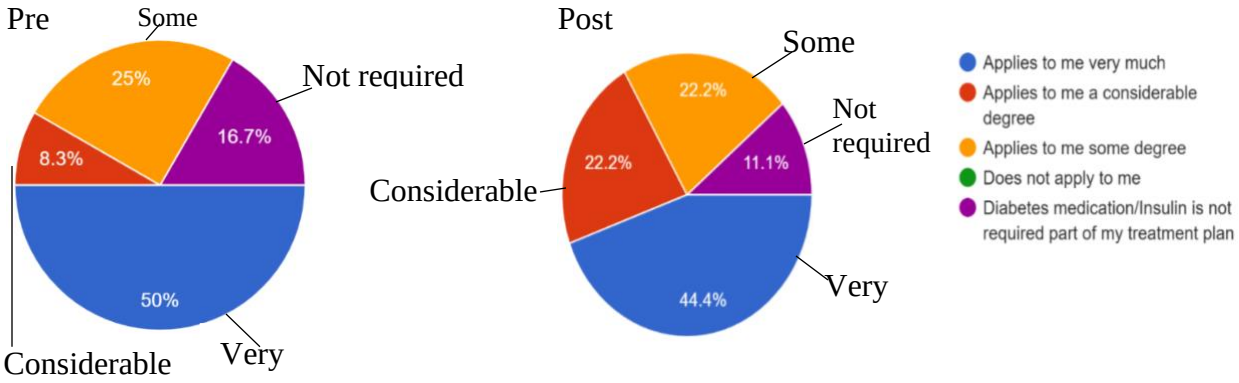
9. The food I choose to eat makes it easy to achieve optimal blood sugar levels.



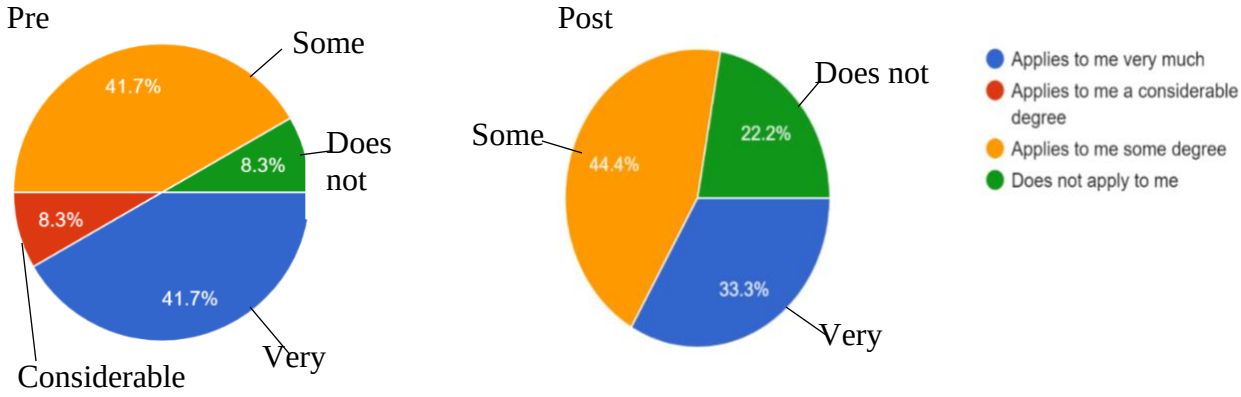
10. I keep all doctors' appointments recommended for my diabetes treatment.



11. I take my diabetes medication (e.g., insulin, tablets as prescribed).

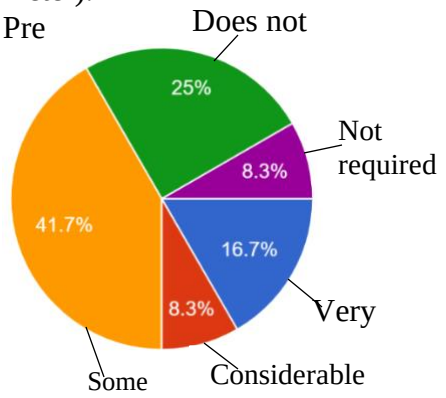


12. Occasionally I eat lots of sweets or other food rich in carbohydrates.

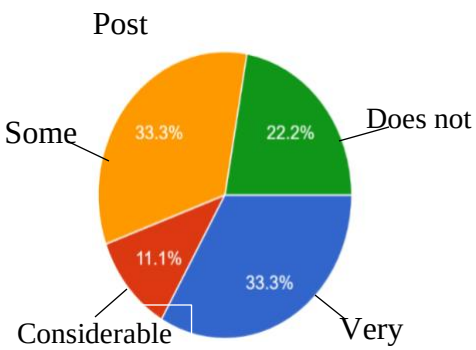


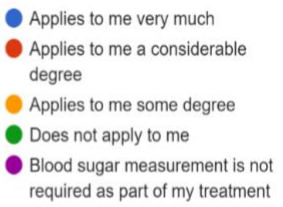
13. I record my blood sugar levels regularly (or analyze the value chart with my blood glucose meter).

Pre



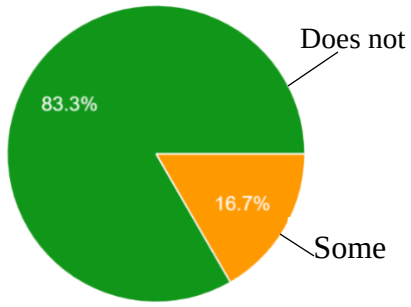
Post



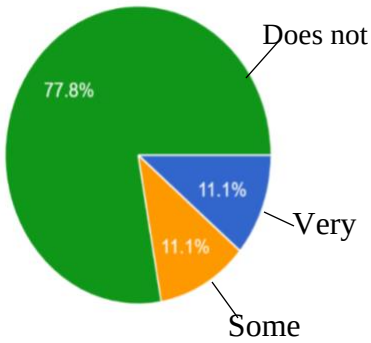


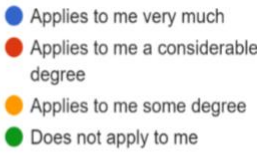
14. I tend to avoid diabetes-related doctors' appointments.

Pre



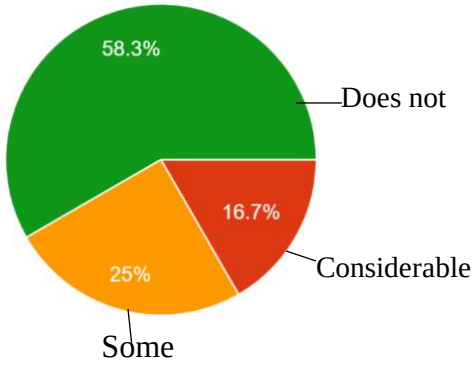
Post



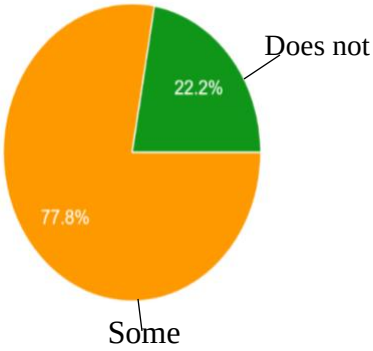


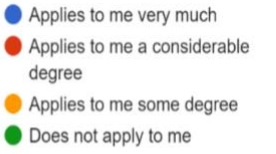
15. I do regular physical activity to achieve optimal blood sugar levels.

Pre



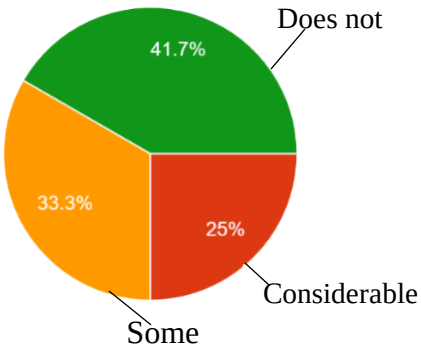
Post



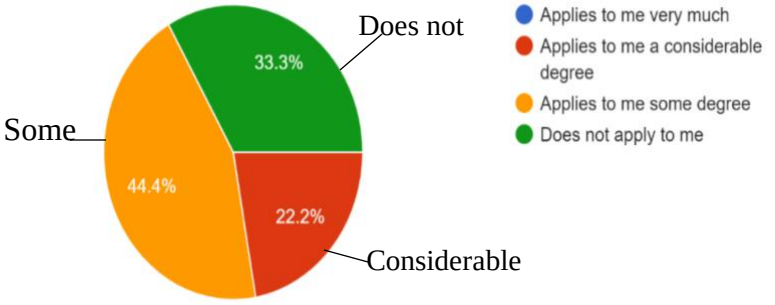


16. I strictly follow the dietary recommendations given by my doctor or diabetes specialist.

Pre

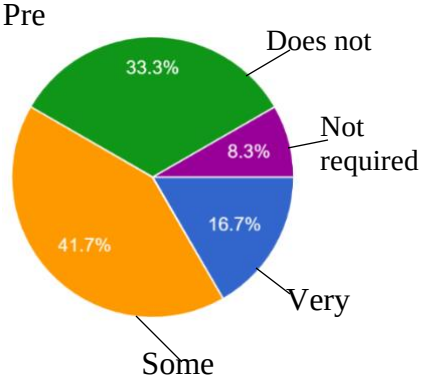


Post

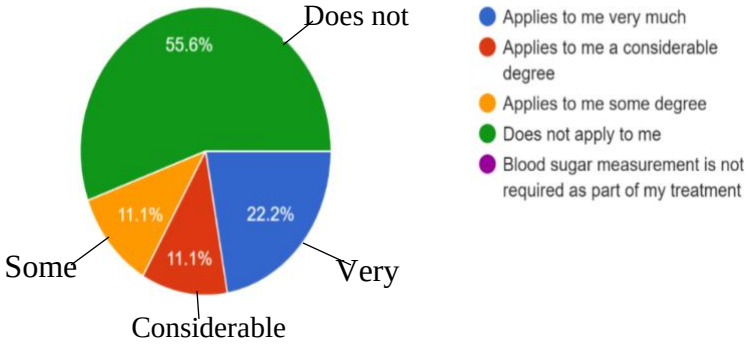


17. I do not check my blood sugar levels frequently enough as would be required for achieving good blood glucose control.

Pre

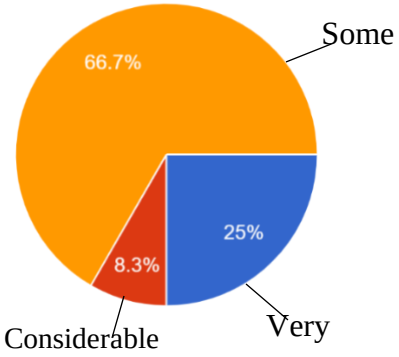


Post

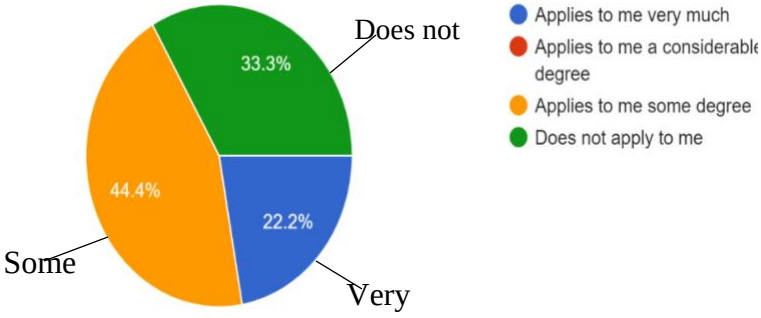


18. I avoid physical activity, although it would improve my diabetes.

Pre

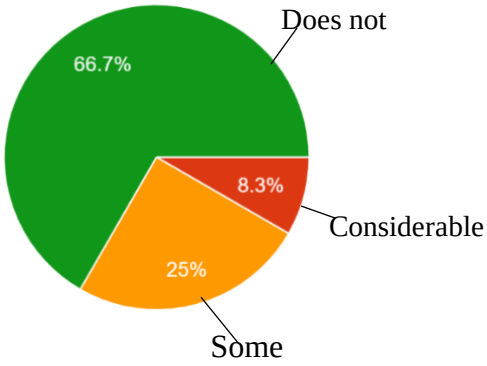


Post

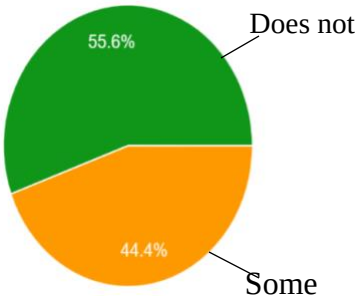


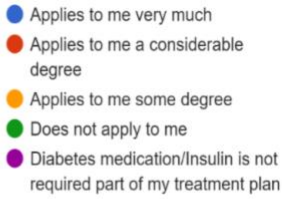
19. I tend to forget to take or skip my diabetes medications (e.g., insulin, tablets).

Pre



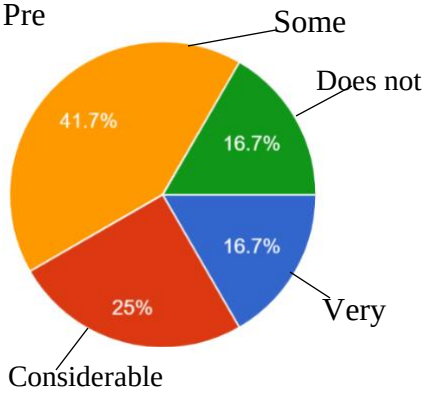
Post



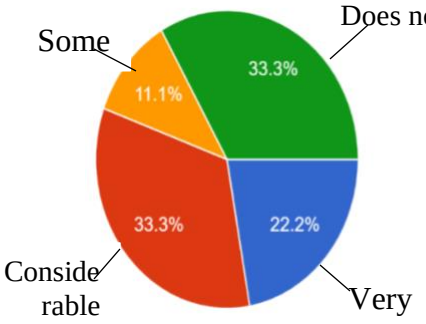


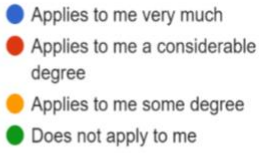
20. Sometimes I have real 'food binges' (not triggered by hypoglycemia).

Pre



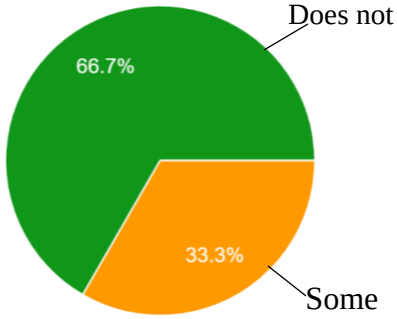
Post



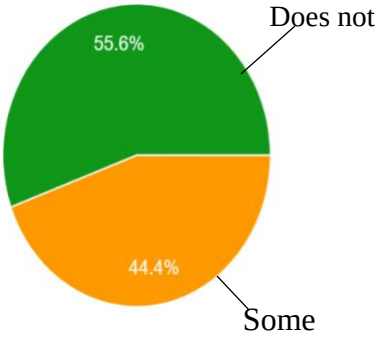


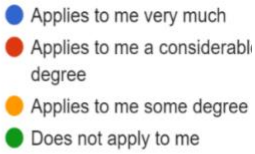
21. Regarding my diabetes care, I should see my medical practitioner(s) more often.

Pre

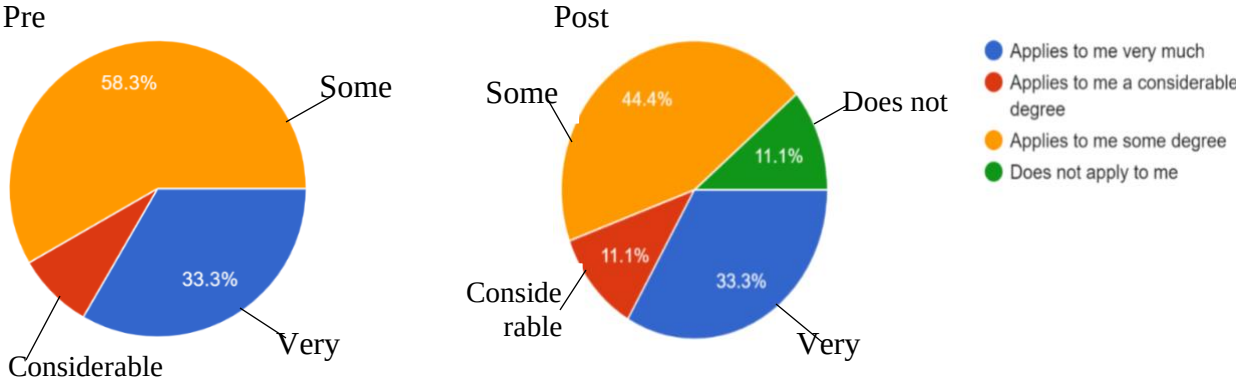


Post

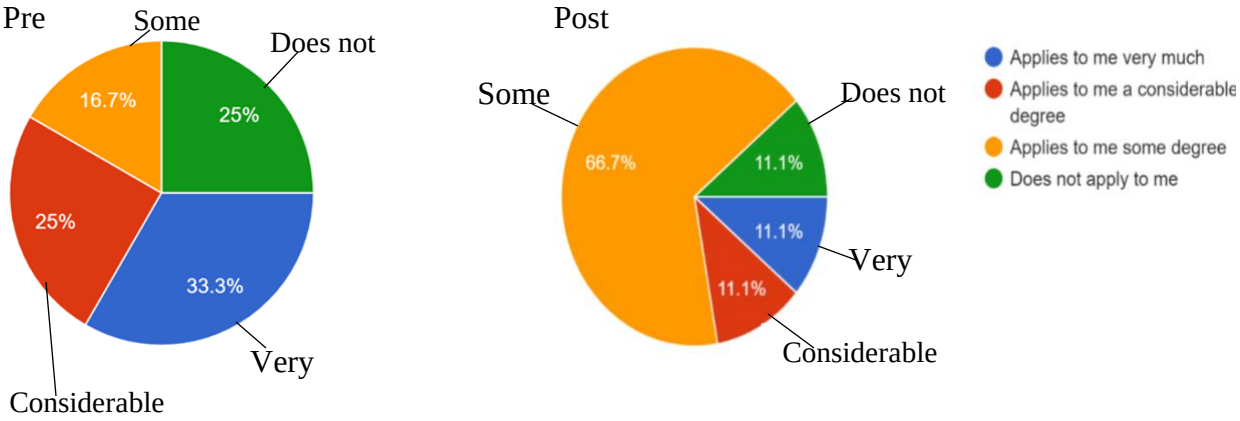




22. I tend to skip planned physical activity.



23. My diabetes self-care is poor.



Data Analysis

Quantitative measures were utilized to draw inferences from the data collected. Statistical Package for the Social Sciences (SPSS) software provided by Abilene Christian University was used to perform the following statistical data analysis. The previously suggested analysis was going to be a one-way analysis of variance (ANOVA) and a chi-square test to examine the data's strength. The Mann-Whitney U test was going to be used for not normally distributed data. With the limited number of participants, the best analysis for the data was the Wilcoxon signed-rank test. This analytical method will provide the ability to determine the significance of the data obtained.

There was a noted increase in the frequency of monitoring blood glucose after the educational intervention, with the *p*-value being .05; there was no noted significance in the increase of monitoring at .279. After the educational intervention, there was a decrease in the care and attention used to check blood glucose. This decrease was at .258, which was not statistically significant. After the educational intervention, there was a noted decrease in the choice of foods used to achieve optimal blood sugar at .414. This decrease, however, did not have any statistical significance.

After the educational session, there was a noted increase in keeping diabetes doctors' appointments at .157, which was not noted to be statistically significant. There was a decrease in taking diabetes medications as prescribed after the educational session. The decline was not noted to be statistically significant at .257. There was noted to be an increase in carbohydrates and sweets after the educational session at 1.00, which is not statistically significant. There was a noted decrease in regularly recording blood glucose after the educational session at .141, which was not statistically significant. In comparing the prequestionnaire to the postquestionnaire in avoiding diabetes-related doctors' appointments, there that a noted decrease in avoidance at .180, which was not statistically significant.

In comparing the postquestionnaire to the prequestionnaire regarding utilizing physical activity to achieve optimal blood sugar levels, this was found to be a statistically significant decrease from the prequestionnaire in performing physical activity regularly at .046. There was also a noted decrease in strictly following dietary recommendations from the prequestionnaire to the postquestionnaire; however, this was not statistically significant at .655.

In analyzing the prequestionnaire to the postquestionnaire regarding whether participants checked their blood glucose levels frequently enough to achieve good blood glucose control,

there was a noted increase in the postquestionnaire; however, this was not noted to be statistically significant at .564. Question 18 evaluated whether participants avoided physical activity; there was an increased avoidance in the postquestionnaire; however, this was not noted to be statistically significant at .102. Question 19 in the pre- and postquestionnaire evaluated whether the participants tended to forget or skip their medications. There was no noted change between the pre- and postquestionnaire; however, it was not noted to be statistically significant at 1.0.

Question 20 of the pre- and postquestionnaire evaluated if the participants had food binges that were not triggered by hypoglycemia. There were no noted changes between the pre- and postquestionnaire; this was not noted to be statistically significant at 1.0. Question 21 evaluated whether the participants believed they should see their providers more often for their diabetes care. This was noted to decrease from the pre- to postquestionnaire; however, this was not statistically significant at .083.

In the pre- and postquestionnaires, question 22 evaluated whether participants skipped planned physical activity; there was no change between the two groups. This was not noted to be statistically significant at 1.0. Question 23 evaluated whether individuals viewed their diabetes self-care as poor. This was noted to increase in the postquestionnaire compared to the prequestionnaire but was not statistically significant at .458.

Utilizing the Wilcoxon signed-rank test to compare the prequestionnaire to the postquestionnaire results overall found that all but one of the questions was noted not to have a statistical significance. The only question that resulted in a statistical significance was evaluating performing physical activity regularly to achieve optimal blood sugar levels. The data obtained

from this question indicated that there was statistical significance noted with a decrease in performing regular physical activity after the educational session.

Question Guiding the Inquiry

The question guiding this DNP project was: How do adult noninsulin-dependent type II diabetics between the ages of 18–64 (P) who receive a diabetic educational session focused on blood glucose monitoring (I) affect the frequency of self-monitoring, (C) and do they experience an increase in self-monitoring (O) within a two-month period (T)? The population (P) being examined were adult type II diabetics who were not currently taking insulin therapy. The intervention (I) implemented in this project was a focused diabetes educational session on blood glucose monitoring. The expected outcome (O) was an increase in the frequency of monitoring. The time frame (T) in which this quality improvement project was being conducted is within two months. Utilizing the Wilcoxon signed-rank test pre- and postquestionnaire evaluated the median between these two variables to test the null hypothesis. For this question, there was only one statistically significant variable found, which was question 15 that examined the participants' physical activity. It was noted to have a statistical significance of a decrease in physical activity after the educational intervention at .046. Questions seven through 23, excluding question 15, did not show any statistical significance in the data obtained.

Reliability and Validity

The Diabetes Self-Management Questionnaire (DSMQ) was used for part of the pre-and postquestionnaire. The DSMQ was developed at the Research Institute of Diabetes Academy Mergentheim. Originally this questionnaire was developed in Germany but was converted to English translation following forward and backward translation. The DSMQ questionnaire has been evaluated for consistency and reliability. The overall internal consistency was found to be

.84, and each subscale showed acceptable constancy as well. Reliability has been established for this questionnaire (Schmitt et al., 2013). Questions one through five on both the pre- and postquestionnaire have not been tested for reliability or validity.

The limited sample size was a significant factor that impacted the reliability and validity of this evidence-based quality improvement project. Out of the 195 participants selected for participation, 12 completed the prequestionnaire. Of those 12 participants, seven participants were excluded related to not completing the postquestionnaire ($n = 3$) or using insulin therapy ($n = 4$). Of the nine participants participating in the postquestionnaire, four participants were excluded; of the four participants, two were excluded based upon only completing the postquestionnaire, and the other two were excluded based upon utilizing insulin therapy. It was difficult to obtain statistical significance and generalizability to the general population in using a small sample size.

Chapter Summary

Chapter 4 provided the reader with an understanding of the raw data obtained from this DNP project. The chapter evaluated the data utilizing the Wilcoxon signed-rank test to determine statistical significance. In implementing this analysis, it was determined that only one variable was statistically significant, while the other variables had no statistical significance.

Chapter 5: Discussion of Findings

Chapter 1 described the importance of a focused educational session for blood glucose management. Chapter 2 examined the existing literature regarding a focused diabetes academic session and self-management. Chapter 3 outlined the organization, methodology, and quality improvement project implementation. The DNP project aimed to evaluate the effects of a focused diabetes educational session and its impact on the frequency of monitoring blood glucose. This project aimed to evaluate the efficacy of a focused diabetes education course discussing the self-management intervention of routinely monitoring blood glucose and increasing the frequency of monitoring. The findings from this project enabled providers to recommend the self-management of monitoring blood glucose for this patient group, which was beneficial in managing diabetes. The long-term result of this project is that patients and providers have additional studies supporting the evidence-based recommendations regarding self-management strategies for diabetics. Chapter 4 analyzed the questions and examined the data collected from implementing this DNP project. Chapter 4 also offered an interpretation of the data collected and discussed the findings obtained from this project further to guide individuals and providers in implementing evidence-based self-management strategies.

Chapter 5 will provide a broader meaning for the data analysis previously presented. Within this chapter, there will be a discussion regarding an interpretation and inferences of the findings, implications for leaders, a discussion of the DNP nursing essentials, and further researcher recommendations.

Interpretation and Inference of Findings

The data obtained from this quality improvement project was found to have no statistical significance between the pre- and postquestionnaire groups except for question 15. Question 15

evaluated whether the participants participated in regular physical activity to achieve optimal blood sugar levels. The data indicated that participants' participation in regular physical activity decreased with the implementation of the educational session. A possible explanation for the decrease in physical activity noted between the pre- and postquestionnaire groups was that the educational session provided additional insight into what regular physical activity consisted of. With the increased awareness of physical activity, the participants became more self-aware of their actual physical activity. Another possible explanation for the noted decrease in physical activity between the pre- and postquestionnaire was that participants became less physically active over time as the study was conducted in fall and early winter. The change in the climate may have influenced the individual's ability to be active.

There was noted to be an increase in the frequency at which participants checked their blood glucose after implementing the focused educational session. However, this increase in frequency was not found to be statistically significant with the data obtained. There was also a noted increase in the participant's awareness of not monitoring their blood glucose frequently enough as required to achieve good blood glucose control. The increase noted in the postquestionnaire group can result from the focused educational session and becoming more aware of the importance of monitoring blood glucose and when to monitor blood glucose appropriately. However, the data obtained from this variable was also found not to be statistically significant.

The theoretical framework of this quality improvement project was the health belief model. This theoretical framework evaluates whether individuals perceive their illness as a threat and whether they believe that the recommended interventions provide enough benefit to be implemented into their care. This theoretical model provided the underpinnings for this quality

improvement project by evaluating whether individuals perceived their diabetes as a threat to their quality of life and if they perceived blood glucose monitoring as an intervention that would improve their quality of life. The study results indicated no statistical significance between the pre- and postquestionnaires. With there being no statistical significance noted between the two groups after the intervention, there was no data to support the implementation of a focused diabetes educational session for noninsulin-dependent type II diabetics.

The focus of this quality improvement project was to evaluate whether a focused diabetes educational session with adults with noninsulin-dependent type II diabetes increased the frequency of monitoring. The data obtained from this quality improvement project was found not to be statistically significant except for one question, which evaluated physical activity.

The findings from this quality improvement project have not provided statistically significant data to support the implementation of blood glucose monitoring in noninsulin-dependent type II diabetics. The information obtained from this quality improvement project can provide clinicians with additional evidence supporting not implementing blood glucose monitoring for this patient population.

Implications for Leaders

Current nursing leadership should care about the findings of this project as it pertains to patient care and evidence-based interventions. Current nursing leaders are focused on implementing evidence-based interventions into clinical practice. The results of this quality improvement project were not statistically significant in that there was no benefit for noninsulin-dependent type II diabetics for blood glucose monitoring by implementing a focused educational session and increasing the frequency of monitoring. Although this study's results were limited related to the small sample size, the study design can provide a framework for additional studies

to be implemented with a large sample size to obtain further data. Previous studies indicated no benefit in implementing blood glucose monitoring for noninsulin-dependent type II diabetics. The data from this study showed no statistical significance in implementing a focused diabetes educational session and impacting the frequency of monitoring blood glucose. A recommendation for nursing leaders is to implement this project with a larger sample size to evaluate further focused educational sessions and their impact on self-management interventions for diabetics.

The data obtained from this quality improvement project can provide a foundation for future nurses to implement a quality improvement project. This quality improvement project can provide the basis for other nursing students to evaluate blood glucose monitoring in noninsulin-dependent type II diabetics. By implementing this quality improvement project, there is potential to obtain a large sample size that can increase generalizability to the public.

The data obtained from this quality improvement project could provide information for the community if it were to have a larger sample size. Since the study was limited in participants, the data from the study could not be generalized to the public. However, the data did not show any statistical significance indicating that implementing blood glucose monitoring in noninsulin-dependent type II diabetics did not impact the frequency of monitoring.

Evidenced-Based Practice Findings and Relationship to DNP Essentials

There are eight essential elements of the doctoral-educated nurse practitioner. These eight essentials outlined the elements and competencies required by DNP programs. These essentials provided the basis for providers to be more equipped to meet the complexity of the ever-changing healthcare system.

Essential I

Essential I comprises the application of theoretical underpinnings for clinical practice. This essential focuses on the application of science and middle-range nursing theories. Using nursing-based theories to expand upon nursing science and science-based concepts help further evaluate and improve healthcare outcomes (DeCapua, 2016).

This quality improvement project implores the utilization of Essential I by implementing a mid-level nursing theory as the theoretical foundation of the project. The health belief model comprises the theoretical foundation of this quality improvement project. The health belief model provided a framework to explain participants' motives and perceptions regarding their chronic health condition of diabetes. The health belief model provided additional insight into the reason why participants did not increase the frequency of their monitoring after an educational session. In applying the health belief model to this quality improvement project, a potential reason for there being no increase in the frequency of monitoring may result from the participants believing that the intervention of blood glucose monitoring did not provide a benefit in their self-management.

Essential II

Essential II of the DNP programs is comprised of the organizational and leadership for quality improvement. This essential is evidenced by evaluating and disseminating evidence into clinical practice. Organizational and systems leadership skills for quality improvement are evidenced by implementing quality improvement projects or evaluating practice outcomes (DeCapua, 2016).

This quality improvement project implores the utilization of Essential II by evaluating the current evidence gathered regarding a focused educational session for blood glucose monitoring

in the patient population of noninsulin-dependent type II diabetics. Through evaluating the previously obtained evidence regarding this topic, there was a noted gap in recommendations for monitoring blood glucose. Essential II was implemented in this quality improvement project by developing a quality improvement project and determining the impact and recommendations from the results obtained. The quality improvement project did not show any statistical significance for implementing a focused diabetes educational session. The data from the study indicated no improvement in the implementation of the educational session on the frequency of monitoring blood glucose.

Essential III

Essential III of the DNP programs comprises analytical methods for evidence-based practice. With the complexity of healthcare, it is important that clinicians be able to accurately interpret and evaluate patient safety concerns and ethical dilemmas that may arise (DeCapua, 2016). This quality improvement project utilized Essential III throughout the project's implementation assessment, analysis, and interpretation. Scholarship was also used throughout the project in preparation. Research was conducted to assess the current knowledge base and understand the project's current recommendations. Analysis was conducted to interpret the data and to determine the statistical significance of the data obtained. Critical analysis was conducted to evaluate the generalizability of the data obtained to the general population.

Essential IV

The fourth essential of the DNP program comprises informational systems and technology. This essential focus is on implementing technology to improve and transform healthcare. Technology is an integral aspect of healthcare with the implementation of healthcare reform and technology mandates. Having a foundational understanding of technology and how it

can impact healthcare can enable providers to advocate for patient care and ethical considerations that can arise (DeCapua, 2016).

This quality improvement project used Essential IV by utilizing an online format for information gathering. Utilizing an online format provided additional protection for the participants in reducing face-to-face contact during the COVID-19 pandemic. Technology was also used in analyzing the data and obtaining statistical analysis through SPSS software. Through the utilization of the software, data analysis was performed on individual questions to determine the significance of the data obtained.

Essential V

Essential V of the DNP program consists of healthcare policy for advocacy in healthcare. The DNP graduate must be able to identify potential problems within the healthcare system and advocate for solutions through legislation and negotiation to address these disparities (DeCapua, 2016). This quality improvement project utilized Essential V to advocate for healthcare policy. If statistical significance had been found in this quality improvement project with a larger sample size, it could have been utilized to spearhead policies for focused online diabetes educational courses for diabetic equipment for noninsulin-dependent type II diabetics.

Essential VI

Interprofessionnel collaboration comprises Essential VI. With the increasing complexity of healthcare, it is essential to implore team collaboration to improve patient health. It is necessary that the DNP-prepared nurse be equipped with the communication and leadership skills necessary to lead a team in healthcare improvement to implement a team approach (DeCapua, 2016).

This quality improvement project could potentially impact interprofessional collaboration between providers' patients and educators. If the study showed a statistical significance between the focused educational session, then an educational session could be developed where providers can refer patients to receive the education. If the study had shown a statistically significant improvement in the frequency of monitoring after the educational session, implementing such a program would benefit the providers and patients in improved healthcare. Since the data did not indicate a significant improvement in the frequency of monitoring blood glucose after the educational session, an online educational session was not indicated.

Essential VII

Clinical prevention and improving national health are Essential VII. This essential focuses on health promotion and risk reduction. Nurses at any level of preparation have a foundation in health promotion and risk reduction. The DNP-prepared provider is equipped to evaluate data further regarding epidemiology, environmental, and biostatistical regarding communities and individuals (DeCapua, 2016).

This quality improvement project was based on health promotion and risk reduction, which is Essential VII. The overarching aim of this project was to reduce the potential risks of type II diabetes and improve the health of the individuals participating. This quality improvement project evaluated a specific intervention such as blood glucose monitoring to determine if the noninsulin-dependent type II diabetic population would benefit from it.

Essential VIII

Essential VIII is composed of advanced nursing practice. The DNP-prepared provider is equipped with an advanced level of clinical judgment and critical thinking level. The advanced

provider is equipped with the ability to mentor and guide nurses and patients through complex situations (DeCapua, 2016).

This quality improvement project implored Essential VII by utilizing advanced critical thinking to analyze the need for improved patient outcomes. Diabetes is a chronic health condition that has a huge impact on the health delivery system. It is important to ascertain ways to improve the health of those individuals who have been diagnosed with diabetes and reduce the risks associated with this diagnosis.

Recommendations for Future Research

Recommendations for future research regarding this topic would greatly benefit the community of knowledge. One recommendation is to replicate this study design with a larger study population to obtain statistical inferences and to be able to evaluate the statistical significance between variables adequately. Having a large sample size would provide additional information and improve the generalizability of the study to the general population. An increased understanding of this topic can provide additional support to providers in recommending glucose monitoring in noninsulin-dependent type II diabetics.

Another recommendation for future research is to evaluate whether a continuous glucose monitor would benefit the noninsulin-dependent type II diabetic in obtaining glycemic control. Evaluating whether a continuous glucose monitoring system would be beneficial for noninsulin-dependent type II diabetics can provide additional information for providers in recommending the type of monitoring needed for this patient population. Evaluating continuous glucose monitors can also provide valuable information to insurance companies, which could evaluate extending their coverage of the devices in this patient population. If insurance companies

increase their coverage of these devices, it can increase the patient's accessibility to the devices and their ability to implement them in managing their diabetes.

Summary of the Chapter

Chapter 5 provided the reader with an understanding of the interpretation of the data and inferences that can be made from the data obtained from the DNP project. The chapter also discussed the implications of the data obtained and its implications for leaders. Each of the eight nursing essentials related to the quality improvement project was discussed in this chapter. There were two recommendations for future research to evaluate further blood glucose monitoring in noninsulin-dependent type II diabetics.

Conclusion

The focus of this quality improvement project was to evaluate whether a focused diabetes educational session in adults with noninsulin-dependent type II diabetes increased the frequency of monitoring. The theoretical framework of this quality improvement project was the health belief model. This theoretical framework evaluates whether individuals perceive their illness as a threat and whether they believe that the recommendations provide enough of a benefit to be implemented. This theoretical model evaluates whether individuals perceive certain interventions as being a benefit to their health. This theoretical model provided the underpinnings to this quality improvement project by providing a basis to evaluate whether individuals perceived their diabetes to be a threat to their quality of life and if they perceived blood glucose monitoring as an intervention that would improve their quality of life.

This quality improvement project was implemented online in diabetes support groups. Participants were recruited and asked to participate in two questionnaires: a pre- and a postquestionnaire. After the participants completed the prequestionnaires, they were instructed to

watch a short educational video. After the video, they were given access to a postquestionnaire that they completed within two months. One hundred ninety-five participants were recruited, 12 participants completed the prequestionnaire, and nine participants completed the postquestionnaire. Five participants' responses were analyzed based on completing both the pre- and postquestionnaire and not taking insulin therapy.

The data obtained from the five participants were analyzed with the Wilcoxon signed-rank test. With the limited sample size, it is difficult to obtain statistical significance and generalizability of the results. The data obtained from this quality improvement project was not statistically significant except for one question. Question 15, which evaluated physical activity, demonstrated statistical significance with a noted decrease in physical activity after the educational session.

The information from this study can be valuable to aid a foundation for a larger study size to obtain statistical significance and improve the generalizability of the study. A recommendation for future research can focus on implementing continuous glucose monitoring devices in noninsulin-dependent type II diabetics.

References

American Diabetes Association. (2018, May). Economic costs of diabetes in the United States in 2017. *Diabetes Care, 41*(5), 917–928. https://doi.org/10.2337/dci18-0007

Angwenyi, V., Aantjes, C., Kajumi, M., De Man, J., Criel, B., & Bunders-Aelen, J. (2018, July). Patients experiences of self-management and strategies for dealing with chronic conditions in rural Malawi. *PLOS One*, *13*(7), 1–19. https://doi.org/10.1371/journal.pone.0199977

Bergh, A., Friberg, F., Persson, E., & Dahlborg-Lychage, E. (2015). Registered nurses' patient education in everyday primary care practice: Managers' discourse. *Global Qualitative Nursing Research*, *2*, 1–12. https://journals.sagepub.com/doi/pdf/10.1177/2333393615599168

Bobitt, J., Aguaho, L., Payne, L., Jansen, T., & Schwingel, A. (2019). Geographic and social factors associated with chronic disease self-management program participation: Going the "extra-mile" for disease prevention. *Preventing Chronic Disease*, *16*(25), 1–11. https://doi.org/10.5888/pcd16.180385

Cameron, J. E., Voth, J., Jaglal, S. B., Guilcher, S. J., Hawker, G., & Salbach, N. M. (2018). In this together: Social identification predicts health outcomes (via self-efficacy) in a chronic disease self-management program. *Social Science & Medicine*, *208*, 172–179. https://doi.org/10.1016/j.socscimed.2018.03.007

Centers for Disease Control and Prevention. (n.d.). *About chronic diseases*. National Center for Chronic Disease Prevention and Health Promotion. https://www.cdc.gov/chronicdisease/about/index.htm

Centers for Disease Control and Prevention. (2017). *Diabetes in the United States*. https://www.cdc.gov/diabetestv/diabetes-in-the-us.html

Centers for Disease Control and Prevention. (2019). *About chronic disease*. https://www.cdc.gov/chronicdisease/about/index.htm

Chan, J., Lim, L.-L., Wareham, N., Shaw, J., Orchard, T., Zhang, P., Lau, E., & Eliasson, B. (2020). The Lancet Commission on diabetes: Using data to transform diabetes care and patient lives. *Lancet*, *396*(10267), 2019–2082. https://doi.org/10.1016/ S0140-6736(20)32374-6

Chen, S.-H., Huang, Y.-P., & Shao, J.-H. (2017). Effects of a dietary self-management programme for community-dwelling older adults: A quasi-experimental design. *Scandinavian Journal of Caring Sciences*, *31*, 619–629. https://pubmed.ncbi.nlm.nih.gov/27531033/

Chism, L. A. (Ed.). (2016). *The Doctor of Nursing practice* (3rd ed.). Jones & Bartlett Learning.

Conway, J., Tsourtos, G., & Lawn, S. (2017). The barriers and facilitators that indigenous health workers experience in their workplace and communities in providing self-management support: A multiple case study. *BMC Health Services Research*, *17*(319), 1–13. https://doi.org/10.1186/s12913-017-2265-5

DeCapua, M. (2016). *The essentials of the DNP program*. Springer Publishing. http://www.dnpnursingsolutions.com/dnp-nursing-program-overview/dnp-program-essentials/

Edward, K., Cook, M., Stephenson, J., & Giandinoto, J.-A. (2019). The impact of brief lifestyle self-management education for the control of seizures. *British Journal of Nursing*, *28*(6), 348–354. https://doi.org/10.12968/bjon.2019.28.6.348

Epocrates. (2020). *Type 2 diabetes mellitus in adults*. https://online.epocrates.com/results?query=Type 2 diabetes mellitus in adults

Farmer, A. J., Perera, R., Ward, A., Heneghan, C., Oke, J., Barnett, A. H., Davidson, M. B., Guerci, B., Coates, V., Schwedes, U., & O'Malley, S. (2012). Meta-analysis of individual patient data in randomized trials of self-monitoring of blood glucose in people with non-insulin treated type 2 diabetes. *British Medical Journal*, *344*, e486–e486. https://www.bmj.com/content/344/bmj.e486

Fitch, K., Pyenson, B., & Iwasaki, K. (2013). Medical claim cost impact of improved diabetes control for Medicare and commercially insured patients with type 2 diabetes. *Journal Managing Care Pharmacology*, *19*(8), 609–620. https://www.jmcp.org/doi/pdf/10.18553/jmcp.2013.19.8.609

George, C. M., Bruijn, L. L., Will, K., & Howard-Thompson, A. (2015). Management of blood glucose with noninsulin therapies in type 2 diabetes. *American Family Physician*, *92*(1), 27–34. https://www.aafp.org/afp/2015/0701/p27.html

Grady, P. A., & Gough, L. L. (2014). Self-management: A comprehensive approach to management of chronic conditions. *American Journal of Public Health*, *104*(8), e25–e31. https://doi.org/10.2105/AJPH.2014.302041

Harashima, S., Nishimura, A., Ikeda, K., Wang, Y., Liu, Y., & Inagaki, N. (2016). Once daily self-monitoring of blood glucose (SMBG) improves glycemic control in oral hypoglycemic agents (OHA)–Treated diabetes: SMBG-OHA follow-up study. *Journal of Diabetes Science and Technology*, *10*(2), 378–382. https://doi.org/10.1177/1932296815608869

Hou, Y.-Y., Li, W., Qiu, J.-B., & Wang, X.-H. (2014). Efficacy of blood glucose self-monitoring on glycemic control in patients with non-insulin-treated type 2 diabetes: A meta-analysis. *International Journal of Nursing Sciences*, *1*(2), 191–195. https://doi.org/10.1016/j.ijnss.2014.05.003

Institute for Work and Health. (2015). *Primary, secondary and tertiary prevention*. https://www.iwh.on.ca/what-researchers-mean-by/primary-secondary-and-tertiary-prevention - :~:text=1 Primary prevention. Primary prevention aims to prevent,swimming hole used by kids and adults alike

Isaksson, U., Hajdarevic, S., Abramsson, M., Stenvall, J., & Hörnsten, Å. (2015). Diabetes empowerment and needs for self-management support among people with type 2 diabetes in a rural inland community in northern Sweden. *Scandinavian Journal of Caring Sciences*, *29*(3), 521–527. https://doi.org/10.1111/scs.12185

Jager, J., Putnick, D. L., & Bornstein, M. H. (2017). More than just convenient: The scientific merits of homogeneous convenience samples. *Monographs of the Society for Research in Child Development*, *82*(2), 13–30. https://doi.org/10.1111/mono.12296

Kjellsdotter, A., Berglund, M., Jebens, E., Kvick, J., & Andersson, S. (2020). To take charge of one's life—group-based education for patients with type 2 diabetes in primary care—a lifeworld approach. *International Journal of Qualitative Studies on Health and Well-being*, *15*(1). https://doi.org/10.1080/17482631.2020.1726856

Kreider, K. (2020, March). *Continuous glucose monitoring: A comprehensive review for the nurse practitioner* [Presentation]. American Association of Nurse Practitioners. https://learningcenter.inreachce.com/viewer_mobile/Phone.aspx?eid=561c0b5f-05b6-4881-83ad-22b118d41d5f&oid=aanp&uid=demo&aid=%7Baid%7D

LaMorte, W. W. (2018). *Behavioral change models: The health belief model*. Boston University School of Public Health. http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories2.html

LaMorte, W. W. (2019). *The health belief model*. Boston University School of Public Health. http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories2.html

Lexico. (2020a). *Quality of life*. https://www.lexico.com/definition/quality_of_life

Lexico. (2020b). *Self-assessment*. https://www.lexico.com/definition/self-assessment

Macha, K., & McDonough, J. P. (2012). *Epidemiology for advanced nursing practice*. Jones & Bartlett Learning.

Mahoney, D. (2020). Beware of the possibility of unreliability of A1c. *Journal for Nurse Practitioners*, *16*(6), 420–424. https://doi.org/10.1016/j.nurpra.2020.03.017

Malanda, U. L., Bot, S. D., & Nijpels, G. (2013). Self-monitoring of blood glucose in noninsulin-using type 2 diabetic patients. *Diabetes Care*, *36*(1), 176–178. https://doi.org/10.2337/dc12-0831

Nilsen, P. (2015). Making sense of implementation theories, models, and frameworks. *Implementation Science*, *10*(53), 1–13. https://doi.org/10.1186/s13012-015-0242-0

Rodger, W. (1991). Non-insulin-dependent (type II) diabetes mellitus. *Canadian Medical Association Journal*, *145*(12), 1571–1581. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1336077/

Roeckelein, J. E. (2006). *Elsevier's dictionary of psychological theories*. Elsevier.

Sapkota, S., Brien, J. E., & Aslani, P. (2017). Blood glucose monitoring in type 2 diabetes–Nepalese patients' opinions and experiences. *Global Health Action*, *10*(1), 1322400. https://doi.org/10.1080/16549716.2017.1322400

Schmitt, A., Gahr, A., Hermanns, N., Kulzer, B., Huber, J., & Haak, T. (2013). The diabetes self-management questionnaire (DSMQ): Development and evaluation of an instrument to assess diabetes self-care activities associated with glycemic control. *Health and Quality of Life Outcomes*, *11*(138), 1–14. http://doi.org/10.1186/1477-7525-11-138

Shaw, A. (2012, December). *The health belief model and social marketing*. Strategic Planet. https://www.strategic-planet.com/2012/12/the-health-belief-model-and-social-marketing/

Tanenbaum, M. L., Leventhal, H., Breland, J. Y., Yu, J., Walker, E. A., & Gonzalez, J. S. (2015). Successful self-management among non-insulin-treated adults with type 2 diabetes: A self-regulation perspective. *Diabetic Medicine*, *32*(11), 1504–1512. https://doi.org/10.1111/dme.12745

United Health Foundation. (2019). *Annual report: Diabetes in Texas*. https://www.americashealthrankings.org/explore/annual/measure/Diabetes/state/TXF

Appendix A: Diabetes Self-Management Questionnaire (DSMQ)

	The following statements describe self-care activities related to your diabetes. Thinking about your self-care over the last 8 weeks, please specify the extent to which each statement applies to you.	Applies to me very much	Applies to me to a consider-able degree	Applies to me to some degree	Does not apply to me
1.	I check my blood sugar levels with care and attention. ☐ *Blood sugar measurement is not required as a part of my treatment.*	☐3	☐2	☐1	☐0
2.	The food I choose to eat makes it easy to achieve optimal blood sugar levels.	☐3	☐2	☐1	☐0
3.	I keep all doctors' appointments recommended for my diabetes treatment.	☐3	☐2	☐1	☐0
4.	I take my diabetes medication (e. g. insulin, tablets) as prescribed. ☐ *Diabetes medication / insulin is not required as a part of my treatment.*	☐3	☐2	☐1	☐0
5.	Occasionally I eat lots of sweets or other foods rich in carbohydrates.	☐3	☐2	☐1	☐0
6.	I record my blood sugar levels regularly (or analyse the value chart with my blood glucose meter). ☐ *Blood sugar measurement is not required as a part of my treatment.*	☐3	☐2	☐1	☐0
7.	I tend to avoid diabetes-related doctors' appointments.	☐3	☐2	☐1	☐0
8.	I do regular physical activity to achieve optimal blood sugar levels.	☐3	☐2	☐1	☐0
9.	I strictly follow the dietary recommendations given by my doctor or diabetes specialist.	☐3	☐2	☐1	☐0
10.	I do not check my blood sugar levels frequently enough as would be required for achieving good blood glucose control. ☐ *Blood sugar measurement is not required as a part of my treatment.*	☐3	☐2	☐1	☐0
11.	I avoid physical activity, although it would improve my diabetes.	☐3	☐2	☐1	☐0
12.	I tend to forget to take or skip my diabetes medication (e. g. insulin, tablets). ☐ *Diabetes medication / insulin is not required as a part of my treatment.*	☐3	☐2	☐1	☐0
13.	Sometimes I have real 'food binges' (not triggered by hypoglycaemia).	☐3	☐2	☐1	☐0
14.	Regarding my diabetes care, I should see my medical practitioner(s) more often.	☐3	☐2	☐1	☐0
15.	I tend to skip planned physical activity.	☐3	☐2	☐1	☐0
16.	My diabetes self-care is poor.	☐3	☐2	☐1	☐0

Appendix B: Pre- and Postquestionnaire

What is your age group?

- 18–29
- 30–39
- 40–49
- 50–59
- 60–65

Primary language?

- English
- NonEnglish

I have been diagnosed with the following:

- Prediabetes
- Gestational diabetes
- Diabetes
- Insulin resistance

My current treatment plan consists of the following: (Please select all that apply)

- Lifestyle changes (e.g., physical activity, diet changes)
- Insulin therapy
- Tablets
- Noninsulin injections

How often did your healthcare provider recommend monitoring your blood glucose?

- Never
- Daily

- Twice a day
- Three times a day
- Over four times a day

How often do you monitor your blood glucose?

- Never
- Daily
- Twice a day
- Three times a day
- Over four times a day

I check my blood sugar levels with care and attention.

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me
- Blood sugar monitoring is not required as part of my treatment

The food I choose to eat makes it easy to achieve optimal blood sugar levels.

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me

I keep all doctors' appointments recommended for my diabetes treatment.

- Applies to me very much
- Applies to me a considerable degree

- Applies to me some degree
- Does not apply to me

I take my diabetes medication (e.g., insulin, tablets as prescribed).

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me
- Diabetes medication/insulin is not required part of my treatment plan

Occasionally I eat lots of sweets or other food rich in carbohydrates.

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me

I record my blood sugar levels regularly (or analyze the value chart with my blood glucose meter).

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me
- Blood sugar measurement is not required as part of my treatment

I tend to avoid diabetes-related doctors' appointments.

- Applies to me very much
- Applies to me a considerable degree

- Applies to me some degree
- Does not apply to me

I do regular physical activity to achieve optimal blood sugar levels.

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me

I strictly follow the dietary recommendations given by my doctor or diabetes specialist.

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me

I do not check my blood sugar levels frequently enough as would be required for achieving good blood glucose control.

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me
- Blood sugar measurement is not required as part of my treatment

I avoid physical activity, although it would improve my diabetes.

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree

- Does not apply to me

I tend to forget to take or skip my diabetes medications (e.g., insulin, tablets).

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me
- Diabetes medication/insulin is not required part of my treatment plan

Sometimes I have real ‘food binges’ (not triggered by hypoglycemia).

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me

Regarding my diabetes care, I should see my medical practitioner(s) more often.

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me

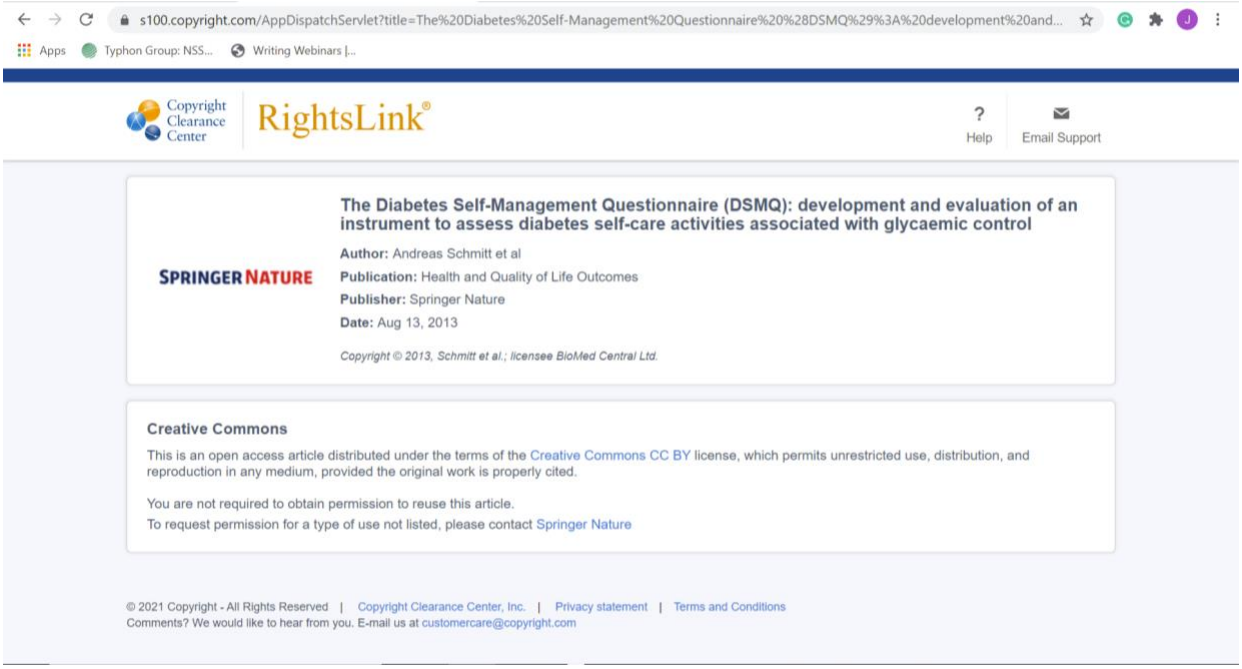
I tend to skip planned physical activity.

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me

My diabetes self-care is poor.

- Applies to me very much
- Applies to me a considerable degree
- Applies to me some degree
- Does not apply to me

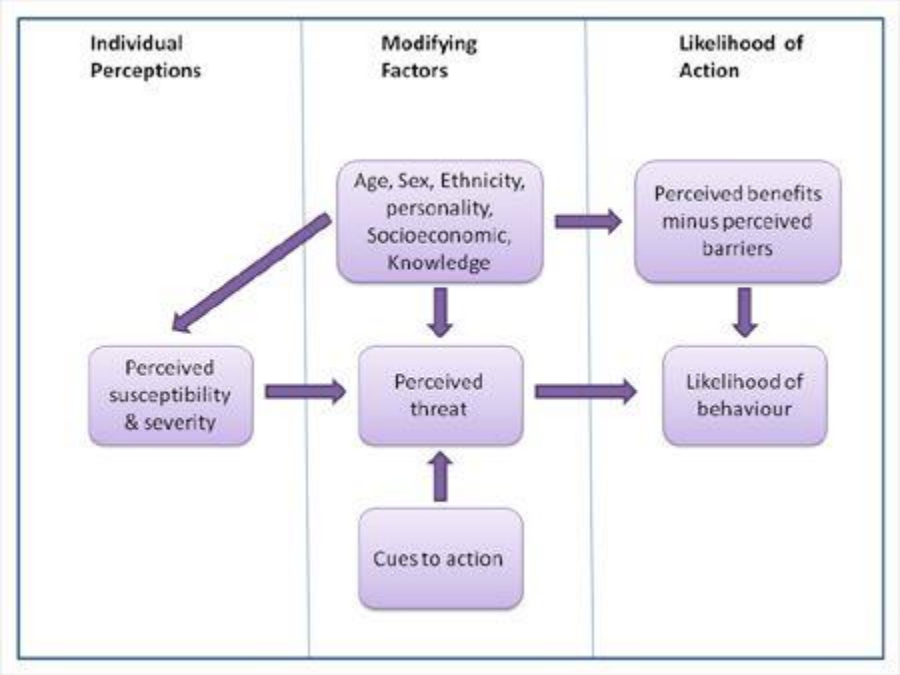
Appendix C: Permission to Use Tool



Appendix D: The Health Belief Model

Figure D1

The Health Belief Model



Note. From "*The Health Belief Model and Social Marketing*," by A. Shaw 2012, December, Strategic Planet (https://www.strategic-planet.com/2012/12/the-health-belief-model-and-social-marketing/). Copyright 2012 by Strategic Planet.

Appendix E: Consent Form

Introduction: Type II diabetes blood glucose monitoring and quality of life

You may be able to take part in a research study. This form provides important information about that study, including the risks and benefits to you as a potential participant. Please read this form carefully and ask the researcher any questions that you may have about the study. You can ask about research activities and any risks or benefits you may experience. You may also wish to discuss your participation with other people, such as your family doctor or a family member.

Your participation in this research is entirely voluntary. You may refuse to participate or stop your participation at any time and for any reason without any penalty or loss of benefits to which you are otherwise entitled.

PURPOSE & DESCRIPTION: This is a quality improvement project regarding a diabetic educational session focusing on the self-management intervention of glucose monitoring and how this affects the frequency at which you monitor your blood glucose and impacts your quality of life. I am asking you to take part because you are a type II diabetic who is not currently taking insulin therapy. Please read this form carefully and ask any questions you may have before agreeing to take part in the quality improvement project.

What this quality improvement project is about: The purpose of this quality improvement project is to implement a focused diabetes education course and to evaluate how it affects the frequency of monitoring and how it impacts your quality of life. To participate in this project, you must be between the ages of 18 and 65, primary language of English, have a 6th-grade reading level, not currently taking insulin, a type II diabetic, and have the supplies to monitor your blood glucose.

What I will ask you to do: If you agree to participate in this quality improvement project, I will have you complete a prequestionnaire prior to starting the diabetic educational session, which takes approximately 10–15 minutes. After the educational session, I will have you complete a postquestionnaire that will be conducted two months later and will approximately take 10–15 minutes to complete. The questionnaire will include questions about your employment, your education, how often you monitor your blood glucose, and quality of life questions.

RISKS & BENEFITS: There are risks to taking part in this research study. Below is a list of the foreseeable risks, including the seriousness of those risks and how likely they are to occur. There is the risk that you may find some of the questions about your employment, health conditions, or education to be sensitive. I do not anticipate any other risks to you participating in this study other than those encountered in day-to-day life.

There are potential benefits to participating in this study. Such benefits may include the benefits to you are a focused diabetes educational course that is free. The researchers cannot guarantee that you will experience any personal benefits from participating in this study.

PRIVACY & CONFIDENTIALITY: Any information you provide will be confidential to the extent allowable by law. Some identifiable data may have to be shared with individuals outside of the study team, such as members of the ACU Institutional Review Board. Otherwise, your confidentiality will be protected by using a general sign-up form. Potential participants will be given an email address to email their desire to participate in the quality improvement project. The participants will be emailed the prequestionnaire link along with a link to the presentation. After completion, those participants who meet the requirement for participating will be emailed a postquestionnaire. All information will be de-identified and anonymous.

The primary risk with this study is a breach of confidentiality. However, we have taken steps to minimize this risk. We will not be collecting any personal identification data during the survey. However, Microsoft may collect information from your computer. You may read their privacy statements.

COLLECTION OF IDENTIFIABLE PRIVATE INFORMATION OR BIOSPECIMENS: After identifying information is removed, your data may be used for future research, including by other researchers, without contacting you again.

CONTACTS: If you have questions about the research study, the lead researcher is Jennifer Young, RN FNPC and may be contacted at xxx-xxx-xxxx, xxxxx@acu.edu. If you are unable to reach the lead researcher or wish to speak to someone other than the lead researcher, you may contact Dr. Patricia Sunderhaus at xxxxx@acu.edu. If you have concerns about this study, believe you may have been injured because of this study, or have general questions about your rights as a research participant, you may contact ACU's Chair of the Institutional Review Board and Executive Director of Research Megan Roth, Ph.D. Dr. Roth may be reached at
(xxx) xxx-xxxx
xxxxx@acu.edu
320 Hardin Administration Bldg., ACU Box 29103
Abilene, TX 79699

Additional Information

Your participation may be ended early by the researchers for certain reasons. For example, we may end your participation if you no longer meet study requirements, the researchers believe it is no longer in your best interest to continue participating, you do not follow the instructions provided by the researchers, or the study is ended. You will be contacted by the researchers and given further instructions in the event that you are removed from the study.

You, as a participant, will not accrue any financial costs in participating in this study.
The clinical results will be disclosed to participants at the conclusion of the project.
Please let the researchers know if you are participating in any other research studies at this time.

Consent Signature Section

Please sign this form if you voluntarily agree to participate in this study. Sign only after you have read all the information provided and your questions have been answered to your satisfaction. You should receive a copy of this signed consent form. You do not waive any legal rights by signing this form.

Please click the button below if you voluntarily agree to participate in this study. Click only after you have read all of the information provided and your questions have been answered to your satisfaction. If you wish to have a copy of this consent form, you may print it now. You do not waive any legal right by consenting to this study.

_____

Printed Name of Participant

_____

Signature of Participant

_____

Date

_____

Printed Name of Person Obtaining Consent

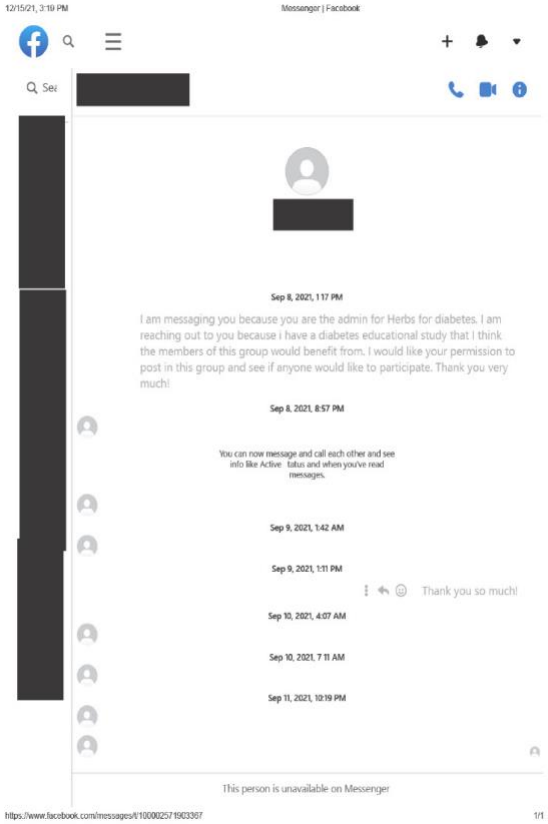
_____

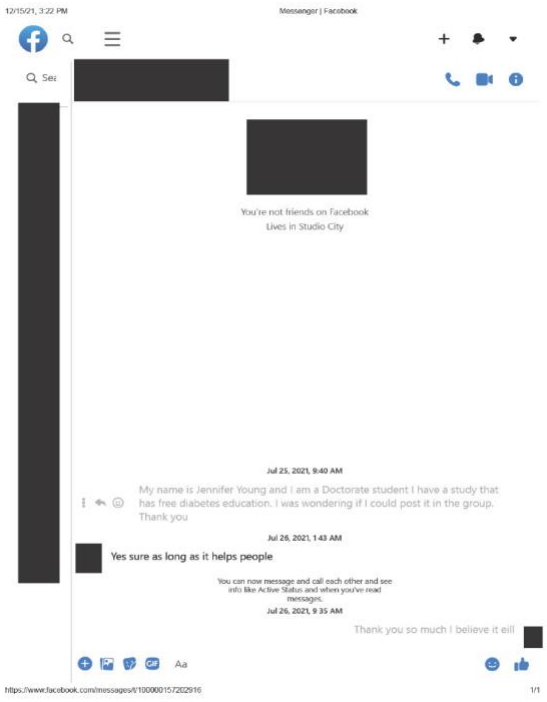
Signature of Person Obtaining Consent

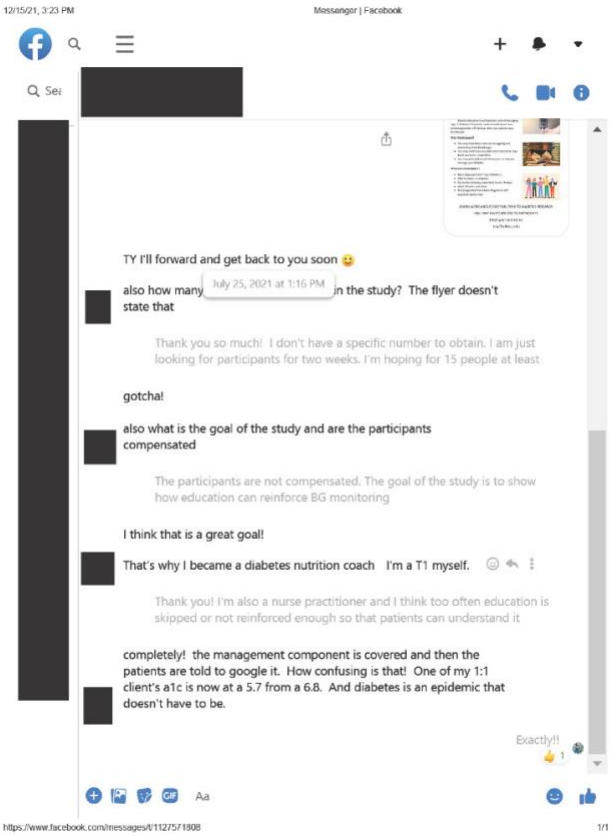
_____

Date

Appendix F: Site Agreement




12/15/21, 3:22 PM
Messenger | Facebook
[redacted]
You're not friends on Facebook
Lives in Studio City
Jul 25, 2021, 9:40 AM
My name is Jennifer Young and I am a Doctorate student I have a study that has free diabetes education. I was wondering if I could post it in the group. Thank you
Jul 26, 2021, 1:43 AM
[redacted] Yes sure as long as it helps people
You can now message and call each other and see info like Active Status and when you've read messages.
Jul 26, 2021, 9:35 AM
Thank you so much I believe it eill [redacted]
Aa
https://www.facebook.com/messages/t/100000157262916
1/1


12/15/21, 3:23 PM
Messenger | Facebook
[redacted]
TY I'll forward and get back to you soon
July 25, 2021 at 1:16 PM
[redacted] also how many [redacted] in the study? The flyer doesn't state that
Thank you so much! I don't have a specific number to obtain. I am just looking for participants for two weeks. I'm hoping for 15 people at least
gotcha!
[redacted] also what is the goal of the study and are the participants compensated
The participants are not compensated. The goal of the study is to show how education can reinforce BG monitoring
I think that is a great goal!
[redacted] That's why I became a diabetes nutrition coach I'm a T1 myself.
Thank you! I'm also a nurse practitioner and I think too often education is skipped or not reinforced enough so that patients can understand it
[redacted] completely! the management component is covered and then the patients are told to google it. How confusing is that! One of my 1:1 client's a1c is now at a 5.7 from a 6.8. And diabetes is an epidemic that doesn't have to be.
Exactly!!
Aa
https://www.facebook.com/messages/t/1127571808
1/1


12/15/21, 3:24 PM
Messenger | Facebook
Facebook
You're not friends on Facebook
July 25, 2021 at 10:58 AM
Jul 16, 2021, 10:33 PM
I am messaging you because you are the admin for a diabetes group. I'm a doctorate student and I was wondering if I could have your permission to see if individuals in this group would be interested in participating in a study that offers free diabetes education on self management strategies? Thank you so much!
Jul 25, 2021, 9:31 AM
I was wondering if you would be able to post my study in your group
You can now message and call each other and see info like Active Status and when you've read messages.
No problem
If ur profile is not lock so I can assess it cos we have too many cases of marketers trying to infiltrate the group
Make ur post pls I will approve it
I sure will Thank you so much!
U are welcome
Aa
https://www.facebook.com/messages/t/100015590193169
1/1


12/15/21, 3:07 PM
Messenger | Facebook
Facebook
You're not friends on Facebook
Aug 21, 2021, 9:57 AM
because you are the administrator for Type 2 diabetes control group. I am a nursing doctoral student and I would like to offer the members a free diabetes educational session as part of a study.
Oct 25, 2021, 10:00 PM
Hi love! I would love to collaborate as I successfully help control diabetes!
You can now message and call each other and see info like Active Status and when you've read messages.
Oct 26, 2021, 9:04 AM
Do you have diabetes?
Nope I practice functional medicine and have been successfully helping patients get off insulin and all their medications with their medical doctors approval!
At any age
oh wow! That great I'm a doctoral student doing a study
Oct 26, 2021, 10:00 AM
Well let's create a possibility to help these patients
Honestly the meds don't work
And everyone has a different cause to their diabetes
Aa
https://www.facebook.com/messages/t/508778780
1/1

Appendix G: Timeline

Table G1

Timeline

Phases	Task
Phase One	Obtain facility agreement, Chapters 1–3 development, IRB certificates, obtain permission to utilize questionnaire, create the survey on Microsoft Forms questionnaire, IRB approval.
Phase Two	Posting on online diabetes support groups, narrow participants to inclusion criteria, obtain consent, prequestionnaire, educational session, postquestionnaire.
Phase Three	Evaluation of questionnaire results, statistical analysis, final chapters of DNP project, present survey results: final defense.
Final Phase	Submit a paper for publishing.

Appendix H: IRB Approval

ABILENE CHRISTIAN UNIVERSITY
Educating Students for Christian Service and Leadership Throughout the World

Office of Research and Sponsored Programs
320 Hardin Administration Building, ACU Box 29103, Abilene, Texas 79699-9103
325-674-2885

May 11, 2021

Jennifer Young
Department of Nursing
Abilene Christian University

Dear Jennifer,

On behalf of the Institutional Review Board, I am pleased to inform you that your project titled "Diabetes education with a focus on blood glucose self-management: Impacting the frequency of glucose monitoring",

(IRB# 21-060)is exempt from review under Federal Policy for the Protection of Human Subjects.

If at any time the details of this project change, please resubmit to the IRB so the committee can determine whether or not the exempt status is still applicable.

I wish you well with your work.

Sincerely,

Megan Roth

Megan Roth, Ph.D.
Director of Research and Sponsored Programs