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Implementation of Diabetes Self-Management Education to Improve Glycemic Control in Patients with Type II Diabetes: A Quality Improvement Project

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By

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Abstract

Background: Poor glycemic control among adult patients with Type 2 Diabetes is a significant problem with over 40% of patients presenting to the clinic with uncontrolled blood sugar levels. Nearly 70% of those with HbA1c levels above 7% report non-adherence to diabetic self-management activities. Uncontrolled blood sugar increases the risk of complications and premature death.

Methods: This quality improvement project utilized the Plan-Do-Study-Act (PDSA) Cycle. A pre-test post-test quasi-experimental design was implemented to evaluate the impact of a 60-minute educational program based on the 2022 American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES) based on a sample of 15 adult patients with Type 2 Diabetes. The intervention aimed to enhance patients' knowledge on diabetes self-management. Data were collected on participants' diabetes self-management knowledge before and after the DSMES training. Pre- and post-test results were analyzed using paired *t*-tests to assess the intervention's effectiveness.

Results: The DSMES intervention led to a statistically significant increase in participants' knowledge of diabetes self-management.

Conclusion: Despite limitations, such as a small sample size of 15 participants, the findings indicate that DSMES is an effective evidence-based intervention. Implementing DSMES can enhance diabetes self-management knowledge, potentially leading to better glycemic control and reduced risk of complications. Future studies with larger, more diverse populations and long-term follow-up are recommended to validate these findings and further improve diabetes care.

Keywords: *Diabetes self-management education and support, glycemic control, Type 2 diabetes, quality improvement, PDSA cycle*.

I. Introduction

Background

Chronic diseases are a public health crisis because they are a leading cause of disability and death globally (Alenazi et al., 2021). According to the National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP] (2021), chronic illnesses account for more than 90 percent of the United States healthcare expenditure, which translates to $3.8 trillion annually. The direct medical costs attributed to diabetes in the United States is $412 billion (Parker et al., 2024). The indirect costs attributed to decline in productivity due to diabetes related complications is approximately $316 billion (Parker et al., 2024). Diabetes is one of the most problematic healthcare conditions that exists alone or a co-morbidity in the world. Center for Disease Control and Prevention (CDC) (2021) state that diabetes affects more than 400 million people around the world, and more than 30 million Americans. A study conducted by Dougherty and Heile (2020) provides that the age adjusted incidence of the cases of diabetes diagnosis is about 8.4 per 1,000 adults. Furthermore, more than 90 million Americans are prediabetic (CDC, 2021). It is anticipated that by 2040 more than 40 million American adults will have been diagnosed with diabetes (Dougherty & Heile, 2020).

The American Diabetes Association (ADA) is an organization dedicated to improving the health and well-being of diabetic patients through research, evidence based, and quality practices. The 2022 American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES) is one of ADA National standards that promotes continuous ongoing and, quality improvement in diabetes management (Davis et al., 2022). The 2022 ADA's National Standards for DSMES is centered on two important aspects

namely diabetes self-management education (DSME) and diabetes self- management support (DSMS). It is designed to prevent, detect, and treat acute or chronic complications of Type 2 diabetes. The 2022 National Standards for DSME are a critical element for diabetes care because they provide evidence-based education for diabetes prevention and management, facilitates the acquisition of skills and knowledge to optimize self-care, and improve diabetes self-management (Davis et al., 2022).

ADA (2021) has provided statistics pointing to the huge burden exerted by diabetes in Florida. An estimated 2,164,009 individuals are projected to have been diagnosed with diabetes in Florida, making up 12.5% of the adult population in the state (ADA, 2021; Zheng et al., 2019). ADA also estimates that 546,000 individuals in Florida have diabetes but are yet to be diagnosed, exposing them to health risks (ADA, 2021). A high prevalence of adults with prediabetes is also recorded with 5.973 million individuals having high blood glucose levels that cannot be diagnosed as diabetes (ADA, 2021; Zheng et al., 2019). An equally high annual rate of diagnosis at the state level is identified with 146,613 individuals being diagnosed annually (ADA, 2021; Zheng et al., 2019). In addition, when compared to the national prevalence rates of 9.2% for diabetes and 7.4% for pre- diabetes, Florida exceeds national averages with prevalence rates of 8.7 and 9.8%, respectively (ADA, 2021). The American Diabetes Association contends that annually, Florida loses approximately $24.3 billion in diabetes care, which translates to $5 billion in indirect costs and $19.3 billion in direct medical expenses (ADA, 2021). The medical expenses for individuals with diabetes are 2.3 times that of persons not diagnosed with the disease (ADA, 2021; Zheng et al., 2019). The direct and medical expenses that can be attributed to diabetes in Florida are estimated to be 19.3 and 5.5 billion dollars respectively (ADA, 2021; CDC, 2021; Zheng et al., 2019).

The underlying pathogenesis of diabetes is hyperglycemia which results from lack of utilization or lack of insulin in a person's body (Alenazi et al., 2021). The lifestyle interventions that improve insulin resistance, such as physical activity and diet are some of the main risk factors for diabetes. According to Alenazi et al. (2021), non-adherence of diabetes lifestyle modification and self-care behaviors, including lack of glucose monitoring are the factors that have resulted in the increased prevalence of uncontrolled diabetes. Alenazi et al. (2021) adds that more than 5% of adult patients receiving treatment for diabetes experience frequent readmissions and emergency treatments because of uncontrolled or poorly controlled diabetes. Diabetes self-management education (DSME) is recommended by researchers because it facilitates continuous education on self-care behaviors including healthy eating, being active, and glucose monitoring (Ernawati et al., 2021). The education based on the Diabetes Self-Management Education (DSME) empowers patients with Type 2 diabetes to engage in healthy lifestyle, and self-care practices that improve glycemic control (Ernawati et al., 2021). Research shows that lifestyle interventions through self- management education and support not only improves glycemic control but also reduces complications (Shiferaw et al., 2021; Sanaeinasab et al., 2021). Therefore, the aim of this quality improvement project is to implement the 2022 American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES) to improve glycemic control in adult patients with diabetes, and reduce diabetes related complications.

Problem Statement

In the practice setting, the practice problem is poor glycemic control amongst adult patients with Type 2 diabetes in the primary care setting. The glycemic control of adult patients

with diabetes was determined based on the HbA1c results on the patients' medical records, as well as the manual chart review. A task force team was formed to investigate the root cause of poor glycemic control. The team reported that a review of the patient's medical records shows that more than 40 percent of the patients receiving care at the clinic have uncontrolled blood sugar. The team also observed that in the primary care setting, every month approximately 300 adult patients with diabetes are seen. Close to 70 percent of the diabetic patients who return to the primary care with Hb A1C levels of more than 7% report non adherence to self-management activities, such as nutrition, exercises, and glucose monitoring. Patients with uncontrolled blood sugar are at a higher risk for developing diabetic related complications or premature death. Addressing the cause of poor glycemic control is a necessary to mitigate this problem.

Lamptey et al. (2023) report that part of the reason for suboptimal delivery of Diabetes Self-Management Education and Support (DSMES) is the lack of a clear curriculum in many primary care settings, the insufficiency of resources, and the practitioner's will to empower patients to improve diabetes self-management. Many providers in primary care facilities do not fully deliver all components indicated in the ADA National Standards for DSMES Standard Six-Curriculum to their patients, thus increasing the risk of developing diabetes-related complications. When diabetic patients fail to receive the ADA National Standards for DSMES from their health care providers, they struggle to optimize blood glucose control.

Scope of the Problem

It is expected that this project will empower patients to adhere to self-management strategies and facilitate healthy behaviors that will improve their glycemic control. According to the American Diabetes Association's standards of care, one of the most important aspects of

glycemic control is increased knowledge in diabetes self-management strategies, including diet, exercises, and frequent glucose monitoring (ADA, 2023). According to research, the gold standard marker for diabetes complications is the glycated hemoglobin (HbA1c), which is established through glucose monitoring (Tanaka et al., 2020). Glucose monitoring enables the patients to establish whether the prescribed medication is effective, and determine if there is need to adjust the medication, diet, or reestablish the glycemic levels (ADA, 2023). Uncontrolled diabetes or hyperglycemia is characterized by blood glucose levels of more than 126 mg/dL for fasting blood glucose, 200 mg/dL for oral glucose tolerance test, 200 mg/dL for random plasma glucose (ADA, 2019). In primary care facilities in Florida, the prevalence of uncontrolled diabetes is very high. Majority of the adults' patients with diabetes in Florida are at a higher risk of developing diabetic complications due to insufficient knowledge and skills to optimize effective diabetes self-management (ADA, 2021).

Significance of Nursing

The project is designed to improve knowledge on diabetes management. The outcome of the project will empower patients with adequate knowledge on the effectiveness of diabetes lifestyle modification, and self-management activities in improving glycemic control. By providing diabetic patients with knowledge on the effectiveness of diabetes self-management, their health outcomes, and quality of life will be improved. For patients who adhere to the recommended diabetes lifestyle interventions, diabetic related complications will decrease (Lamptey et al. 2023). Therefore, increasing the patient's knowledge of DSMES is paramount to improve glycemic control, and reduce the risk of complications.

Knowledge Gap

Research shows that in the diabetic population, the adherence to lifestyle interventions is very low (Alenazi et al. 2020; Bekele et al. 2020; Lamptey et al., 2023). The high number of patients with uncontrolled blood sugar in the clinic indicate that they do not adhere to the recommended diabetes self-management behaviors. In the practice setting, clinic leaders have also indicated that the increased prevalence of uncontrolled diabetes maybe as a result of existing gaps in the adherence to protocols and practices recommended for diabetes management. This is due to the fact that the healthcare providers adopt a one size fits all intervention for diabetes management. Moreover, the healthcare providers do not adhere to any evidence-based intervention or guideline when treating patients with diabetes. Therefore, the sub-optimal management and control of diabetes by patients seeking care at the primary care clinic may be associated with the lack of patient's knowledge on the ADA recommendations for diabetes self-management.

Consequences of the Problem

When not addressed, uncontrolled diabetes interferes with many aspects of a person's daily life, including driving, social functioning, and employment (Goff, et al., 2020; Lamptey et al. 2023). Uncontrolled blood sugar levels result in long term vascular and neurological complications. ADA (2023) states that diabetes is the leading cause of renal diseases, adult-onset blindness, limb amputation, coronary artery diseases, nerve conduction defects, peripheral vascular diseases, coronary artery diseases, nerve conduction defects, peripheral vascular diseases, and doubles the risk for developing cardiovascular diseases including stroke and heart diseases. Hyperglycemia maybe fatal, with mortality estimates of 10% for patients with diabetes

(ADA, 2023). It is estimated that in the U.S roughly 103,000 diabetes related deaths occur annually (ADA, 2023). Healthcare costs also increase significantly with diabetes complications. In the US, the financial burden of diabetes is more than $300 billion yearly, and as the population continues to live longer, the cost is anticipated to increase significantly (ADA, 2023).

II. Summary of the Literature

Search Strategy

The quality improvement project involves patient education on diabetes self-management with the aim of increasing the patient's knowledge, and enhancing diabetes management using lifestyle modifications that are based on the Diabetes Self-Management Education and Support (DSMES) guidelines. The databases that were used to obtain information on the effectiveness of Diabetes Self-Management Education and Support (DSMES) in improving the glycemic control in patients with diabetes include MEDLINE, Cochrane Database of Systematic Reviews, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and PUBMED databases. The search included peer reviewed articles focusing on the effectiveness of Diabetes Self-Management Education and Support in enhancing glycemic control in adult patients with Type 2 diabetes.

The inclusion criteria were articles published between 2019 and 2023. Only the research articles that were published in English were used. The exclusion criteria were articles written in a language different from English, blogs, editorials, comments, and peer reviewed articles published before 2019. When determining the eligibility for inclusion, the researcher screened the articles for relevance. The search terms that were used include "diabetes self-management education," "diabetes self-care," "diabetes self-management," and "diabetes self-management

education and support". Out of the 600 articles that were retrieved only nine articles met the inclusion criteria.

Selected Studies Relevant to the Clinical Problem

Mikhael et al. (2020) conducted a systematic review and meta-analysis to assess whether there is any association between Diabetes Self-Management Education and Support (DSMES) and glycemic control in patients with Type 2 diabetes. Mikhael et al. (2020) state that in all the reviewed articles, the participants in the intervention group reported improved self-management knowledge and behavior, medication adherence, reduced risk of developing diabetic related complications, and improved quality of life.

Shiferaw et al. (2021) conducted a systematic review and meta-analysis of randomized control trials to determine the effectiveness of patient education on the knowledge, and glycemic control in patients with Type 2 diabetes. After reviewing 19 trials, with 2708 participants, Shiferaw et al. (2021) concluded that educational interventions increase disease knowledge amongst patients with Type 2 diabetes, self-efficacy, and can potentially result in improved glycaemic control levels.

Tanaka et al. (2020) conducted a systematic review and meta-analysis of randomized control trials to establish the effectiveness of Diabetes Self-Management Education and Support (DSMES) in adult patients with Type 2 diabetes mellitus. Tanaka et al. (2020) reviewed 12 studies with 2,386 adults with Type 2 diabetes. Tanaka et al. (2020) reported that Diabetes Self-Management Education and Support (DSMES) have numerous benefits for patients with diabetes including improved glycemic control, improved quality of life, and reduced risk of complications.

Sanaeinasab et al. (2021) conducted a randomized control trial to evaluate the effectiveness of diabetes self-management education in improving the lifestyle and health outcomes of patients with Type 2 diabetes. The study included 80 participants with Type 2 diabetes. Sanaeinasab et al. (2021) randomized the participants into either the intervention or control group. Sanaeinasab et al. (2021) conducted a statistical comparison using the pre and post HbA1c value. Sanaeinasab et al. (2021) reported that individuals with HbA1c levels > 9% who adhered to diabetes lifestyle modifications, report improved glycemic control. In the intervention group education on diabetes management motivated the patients to adhere to lifestyle modifications such as being physically active, and eating diet the recommended for diabetic patients (Sanaeinasab et al., 2021). Sanaeinasab et al. (2021) further reported that in the intervention group, high literacy levels regarding information on diabetes management were not only associated with diabetes lifestyle modification, but also greater glycemic control.

Zheng et al. (2019) conducted a randomized control trial to establish the effectiveness of diabetes self-management education in patients with Type 2 diabetes mellitus. The study included 60 participants. The participants were randomized into the intervention and control group. The researchers conducted a statistical comparison using the pre and post HbA1c value. After the intervention, the researchers reported a statistically significant improvement in the HbA1c levels in the intervention group when compared to the control group. In addition, Zheng et al. (2019) reported improved fasting blood glucose, postprandial 2 h blood glucose, and HbA1c in the control group. Zheng et al. (2019) argued that healthy behaviors are more effective in improving blood glucose levels, when compared to usual care.

Lamptey et al. (2023) conducted a mixed method study to determine the effect of structured self-management education (DSME) interventions on diabetic patients. Lamptey et al.

(2023) reported that after the intervention patients with diabetes Type 2 reported high literacy levels on diabetes management. Lamptey et al. (2023) also stated that in every unit increase in diabetes self-knowledge, they observed a corresponding increase in diabetes self-care activities including diet, physical activities, glucose monitoring. Lamptey et al. (2023) adds that DSMES is a cost-effective tool because it is associated with the reduction or prevention of hospital admissions and readmissions due to diabetes related complications. Lamptey et al. (2023) argue that due to the increased evidence supporting the effectiveness of Diabetes Self-Management Education and Support (DSMES) in improving diabetes management, the patients with diabetes should be encouraged to engage in these interventions to improve diabetes management, quality of life, and reduce the economic burden associated with diabetes complications.

Suardi et al. (2021) conducted literature review to determine the effectiveness of Diabetes Self-Management Education and Support (DSMES) in diet behavior of patients with Type 2 diabetes. Suardi et al. (2021) reported that Diabetes Self-Management Education and Support (DSMES) improved patient's adherence to the recommended diet. The patients who engaged in healthy lifestyle, such as eating healthy also reported improved glycemic control (Suardi et al., 2021). Suardi et al. (2021) adds that glycemic control improvement following implementation of Diabetes Self-Management Education and Support (DSMES) is greatest amongst patients with uncontrolled hyperglycemia.

The systematic review by Ernawati et al. (2019) also highlighted the importance of Diabetes Self-Management Education and Support (DSMES) guided health education programs in the improvement of knowledge on diabetes self-management, and promotion of healthy lifestyle, and glycemic control in patients with Type 2 diabetes. Ernawati et al. (2019) indicated that education on diabetes management empowers patients to adhere to lifestyle modifications

such as being physically active, and eating diet the recommended for diabetic patients. Ernawati et al. (2019) further reported that high literacy levels on diabetes management is not only associated with diabetes lifestyle modification, but also greater glycemic control, and decreased risk for diabetic related complications.

Okeyo et al. (2019) conducted a systematic review study to assess the usefulness of Diabetes Self-Management Education and Support (DSMES) guided health education programs in improving the knowledge on diabetes self-management, and promoting of healthy lifestyle, and glycemic control in patients with Type 2 diabetes. Okeyo et al. (2019) reported that education on diabetes management increases knowledge on diabetes management, and empowers patients to adhere to lifestyle modifications such as being physically active, and eating diet the recommended for diabetic patients. Okeyo et al. (2019) further reported that adherence to diabetes self-management is results in improved greater glycemic control, and decreased risk for diabetic related complications.

III. Purpose, PICO Clinical Question, SMART Goals

Purpose Statement

This quality improvement project will examine the effectiveness of 2022 American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES) in increasing knowledge on diabetes self-management in adults with Type 2 diabetes.

PICO Clinical Question

Among adult patients with Type 2 diabetes in a community outpatient setting (P), will diabetes education, based on the American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES) (I), as compared to current practice(C), increase knowledge on diabetes self-management.

SMART Goals

1. Increase the diabetic patient's knowledge of self-care behaviors including healthy eating, physical activities.
2. Increase the patient's blood glucose self-management behavior to prevent complications.

IV. Organizational Assessment and SWOT Analysis

Completing a SWOT analysis is useful when completing a project because it enables the project team to amplify their strengths, manage the weaknesses, reduce the risks, and take advantage of the opportunities to improve the success of the project.

Strengths

This facility's strength is increased knowledge on diabetes management. Rodriguez et al. (2022) states that using Diabetes Self-Management Education and Support (DSMES) education increases the patient's knowledge on diabetes management. Sanaeinasab et al. (2021) provides that increasing the diabetic patient's knowledge on diabetes management, and increases their ability to manage diabetes, and reduces the risk for complications. Rodriguez et al. (2022) adds that Diabetes Self-Management Education and Support (DSMES) is also associated with increased self-efficacy, and improved glycemic control.

Weaknesses

The facility's weaknesses may include resistance to change, and lack of commitment to learning, and educating patients on self-management behavior. For practice change to occur successfully, these weaknesses should be addressed. The DNP student will provide education to increase knowledge and reduce resistance to change.

Opportunity

The opportunity is the chance to implement evidence-based guidelines to improve the health outcomes of patients with diabetes.

Threats

The threat associated with this quality improvement project is time. The project will be completed within 60 minutes, and this may reduce the opportunity for reinforcement and follow-up.

V. Definition of Terms

The following definitions will be used to guide this project,

Diabetes Self-Management Education and Support (DSMES). This term refers to a process that uses education and training to facilitate the acquisition of skills and knowledge to optimize self-care, and improve diabetes self-management (Mikhael et al., 2020)

Diabetes Self-Management Education: This term refers to an ongoing, interactive, and collaborative process involving patients with Type 2 diabetes, and a healthcare provider (Mikhael et al., 2020). The education process will include (a) assessing the patient's education needs, (b) determining the patient's diabetes related self-management goals, (c) implementation

of behavioral interventions to empower the diabetic patients to achieve the self-management goals, and (d) evaluating the accomplishment of the self-management goals.

Self-Management. This term refers to the patient's adherence to self-management behaviors, which include diet, physical activities, glucose monitoring using glocem glycemic stick three times a day, all of which are necessary for improving glycemic control (Mikhael et al., 2020).

Type 2 Diabetes. This term refers to a disease that results from the body's inability to produce sufficient amount of insulin, convert glucose to energy (Ismail et al., 2021). The diagnosis of diabetes Type 2 will be made when the patient's fasting plasma blood glucose value is >126 mg/dl.

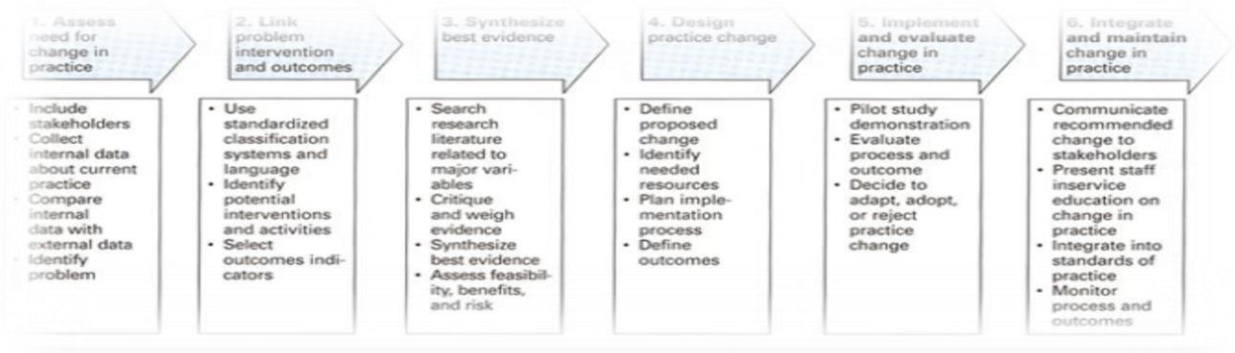
Glycemic control. This term refers to the attainment of Hb A1C levels of less than 7% (Ismail et al., 2021).

Effectiveness. This term refers to improvement in knowledge, self-management, and glycemic control after diabetes self-management education (Mikhael et al., 2020).

VI. Conceptual Underpinning and Theoretical Framework of the Project

Theoretical framework refers to the structure supporting the implementation of any research study (Rougas et al., 2022). The theoretical framework guiding the project is the Rosswurm and Larrabee's (1999) Model for Evidence-Based Practice Change. This model provides guidance for strategies for developing and incorporating evidence-based interventions. The first element in this model is evaluating the need for quality improvement (Rosswurm & Larrabee, 1999). When completing this stage, the DNP student identified uncontrolled Type 2 diabetes as the practice problem, defined the PICOT question, and reviewed literature on the

effectiveness of DSME in improving patient knowledge, and glycemic control. The second step entails linking the practice problem, the proposed intervention, and outcome (Rosswurm & Larrabee, 1999). This phase involves identification of possible interventions that should be implemented to address the practice problem. The DNP student identified Diabetes Self-Management Education and Support (DSMES) as a possible intervention for improving diabetes self-management, and glycemic control. The third step is the appraisal and synthesis of literature that supports the effectiveness of Diabetes Self-Management Education and Support (DSMES) in diabetes management. (Rosswurm & Larrabee, 1999). The fourth step includes designing the proposed practice change, and the implementation strategy (Rosswurm & Larrabee, 1999). This phase will include planning the educational sessions and designing educational materials on diabetes self-management. The fifth step is implementing the proposed change (Rosswurm & Larrabee, 1999). The DNP student will collaborate with the project team when providing diabetes education, based on the 2022 American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES). The last step is integrating the new practices into practice and sustaining the change in practice. After the project is implemented, and outcome evaluated the DNP student will share the findings.



Source: Rosswurm and Larrabee (1999)

VII. Methodology

QI Methodology

The Quality Improvement (QI) methodology for this project is the Plan-Do-Study-Act (PDSA) cycle. PDSA is a systematic approach to continuous improvement, involving planning a change, implementing it, observing the results, and adjusting the approach based on the observations (Zann et al., 2021). The PDSA cycle, comprising Plan, Do, Study, and Act, is integral to this DSMES project (Zann et al., 2021). In the Plan phase, we outlined objectives and designed a pre-post quasi-experimental study to assess DSMES effectiveness. In the Do phase, DSMES training was administered, and participants' diabetes knowledge was tested before and after the intervention (Zann et al., 2021). During the Study phase, paired *t*-tests were conducted to compare pre- and post-test results, evaluating the intervention's impact on diabetes self-management knowledge (Zann et al., 2021). Finally, in the Act phase, findings will guide refinements in DSMES delivery and future educational strategies, promoting continuous improvement in diabetes care (Zann et al., 2021).

Planning Phase

Study Design

The study design for this quality improvement project was a pre- and post-test quasi-experimental design. The design involved collecting data on the participants' knowledge on diabetes self-management before the intervention, followed by the DSMES training, and a post-test of diabetes self-knowledge after the implementation of the DSMES intervention. Pre and post-test results were compared to evaluate the effectiveness of the intervention.

Setting

The project took place in a community-based primary healthcare clinic in South Florida. The clinic provides care to a significant population of adult patients with chronic illnesses. The clinic was appropriate for this quality improvement project because it provides care to a large population of diabetic patients. Every month approximately 300 adult patients with diabetes are seen. More than 40 percent of the patients receiving care at the clinic have uncontrolled blood sugar. The interprofessional team that provides care to the diabetic patients include physicians, registered nurses, diabetes educators, dietitians, and pharmacists.

Sample

The sample population for this project consisted of 15 adult patients with Type 2 diabetes selected through convenience sampling. The electronic health records assisted the researcher in determining the patient's HbA1c levels. Inclusion criteria included English speaking adults aged 18 years and above, with a confirmed diagnosis of uncontrolled diabetes mellitus Type 2 characterized by HbA1c levels exceeding 8%. The exclusion criteria included individuals below 18 years, non- English speaking diabetic patients, patients diagnosed with Type 1 diabetes, gestational diabetes, or end-stage renal disease.

Intervention (DSMES program)

The intervention involved the implementation of the 2022 American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES) program. The intervention was one of ADA National standards that promotes continuous ongoing and, quality improvement in diabetes management (Davis et al., 2022). The

2022 ADA's National Standards for DSMES are centered on two important aspects namely diabetes self-management education (DSME) and diabetes self- management support (DSMS). It is designed to prevent, detect, and treat acute or chronic complications of Type 2 diabetes (Davis et al., 2022). The 2022 National Standards for DSME are a critical element for diabetes care because they provide evidence-based education for diabetes prevention and management, facilitates the acquisition of skills and knowledge to optimize self-care, and improve diabetes self-management (Davis et al., 2022).

The program covers essential aspects of diabetes self-care including education on proper nutrition, emphasizing the importance of a balanced diet, portion control, and understanding the impact of food choices on blood sugar levels (Davis et al., 2022). Physical activity is another crucial component, educating participants on the benefits of regular exercise for glycemic control and overall well-being (Davis et al., 2022). The program also addresses the significance of consistent blood glucose monitoring, teaching individuals how to use monitoring devices effectively. Additionally, DSMES often includes information on medication management, emphasizing adherence to prescribed regimens (Davis et al., 2022).

Guided by the DSMES, the DNP Candidate emphasized information on diabetes self-management behaviors including proper diet, appropriate food portions, and physical activities through the PowerPoint presentations, and use of visual aids. The educational session lasted for approximately 60 minutes.

Instruments

The first instrument was the Demographic and Professional Data Form which included questions regarding age, gender, ethnicity, medications, medication adherence, diet and exercise

information, age of diagnosis, and HbA1c levels of the participants. The second instrument, the Revised Brief Diabetes Knowledge Test (DKT2) (Appendix D), was administered to measure participants' diabetes self-care management knowledge. The revised DKT2 has two sections. The first section contains 14 questions that cover aspects of nutrition, diet, blood glucose self-monitoring, and physical activities (Fitzgerald et al., 2016). The second segment contains 9 items that focus on, medication compliance, particularly insulin (Fitzgerald et al., 2016). The DKT2 took approximately 15 minutes to complete (Fitzgerald et al., 2016). According to Fitzgerald et al. (2016), the reliability of DKT2 is high given an alpha coefficient equal to or greater than 0.7 ($\alpha \geq 0.70$). Fitzgerald et al. (2016) adds that the item-level content validity index ranges from .83 to 1, with a mean scale-level index of .96. The reliability and content validity of the DKT2 underscore its effectiveness as a tool for assessing diabetes self-management knowledge.

In scoring the DKT2, points are assigned for each correct answer, with a higher score reflecting a greater level of diabetes knowledge. Unanswered or missed questions are treated as incorrect. The maximum attainable score is 100% (Fitzgerald et al., 2016). The scores are categorized into three sections namely 75% and above, 75% to 60%, and 59% and below (Fitzgerald et al., 2016). Higher total scores of 75% and above indicate better knowledge in diabetes self- management (Fitzgerald et al., 2016). The DKT2 is freely available for educational purposes, and with no permission required for its use. The DKT2 was administered prior to and following the educational session.

Data Collection and Management

Data collection commenced after approval by the Florida International University Institutional Review Board (IRB). Data was collected from each of the 15 participants that met

the inclusion criteria. The participants were requested to sign the informed consent before the project commenced. Immediately prior to the educational session, the Demographic and Clinical Data Form (see appendix A) was completed. The second instrument that was administered before and after the educational session was the Revised Brief Diabetes Knowledge Test (DKT2) (see appendix B). Higher total scores of 75% and above indicate better knowledge in diabetes self-management.

Protection of Human Subjects

Before the quality improvement project was initiated, the researcher requested study approval by the facility, followed by approval from the FIU IRB. White (2020) states that IRB approval is an impartial third party that is regulated by federal guideline, and its main purpose is to protect the human participants from risk whenever they are involved in any research study. IRB promotes the safety and wellbeing of human participants and ensures that researchers uphold ethical principles and values when conducting research (White, 2020).

Participants completed a written informed consent (see appendix C). Participants were informed about the nature of the project, the benefits, and risks. In addition, the participants were notified that participation was voluntary, and they could withdraw from the study without any negative consequences. Upon signing the consent, the DNP Candidate developed a master key, including the participant's name, contact information, and assigned code number. Only the DNP Candidate had access to any of the study data. The DNP candidate-maintained confidentiality of the participants by ensuring that they remain unidentified throughout the project (White, 2020). Furthermore, collected data would be reported as aggregate data. The study data was stored in a separate locked file cabinet from the informed consents and master key in the locked office of

the DNP Candidate at the facility. For data analysis, the study data was entered into an encrypted, password protected laptop computer which was also stored in the locked office of the DNP Candidate at the facility.

Data Analysis

The IBM Statistical Package for the Social Sciences (SPSS), Version 24 was used for data analysis. The Demographic and Clinical Data Form was analyzed using descriptive statistics, such as numbers, percentages, and frequencies.

To assess the effectiveness of the DKT2 intervention, measured by changes in the pre and post-intervention scores regarding knowledge of diabetic self-care management, a two-tailed paired samples t-test was conducted. A two-tailed test was used because the research aimed to detect any difference in knowledge levels, regardless of whether knowledge increased or decreased. This approach provides a more comprehensive assessment of the intervention's impact.

VIII. Results

Sample Demographics

The study included 15 adult patients diagnosed with Type 2 diabetes in a community outpatient setting. The participants' ages ranged from 18 to 65 years, with an average age of 61.13 years (SD = 9.34) and a median age of 61 years (see Table 1). The gender distribution was slightly skewed, with 53.33% of the participants identifying as female (n = 8) and 46.67% identifying as male (n = 7). Regarding the participant’s ethnicities, the most frequently observed group was African American, comprising 40.00% of the sample (n = 6). This was followed by

White participants, who made up 33.33% (n = 5), and Hispanic participants, who constituted 26.67% (n = 4) of the sample (see Table 2).

Table 1

Summary Statistics Table for Age

Variable	*M*	*SD*	*n*
Age	61.13	9.34	15

Table 2

Frequency Table for Gender and Ethnicity

Variable	*N*	*%*
Gender		
Female	8	53.33
Male	7	46.67
Ethnicity		
Hispanic	4	26.67
African American	6	40.00
White	5	33.33

Note. Due to rounding errors, percentages may not equal 100%.

Comparison of Pre and Post Knowledge Scores

The descriptive statistics indicate a substantial improvement in knowledge post-intervention. The mean score for Pre-Knowledge was 12.87 with a standard deviation of 2.50, while the mean score for post-Knowledge was significantly higher at 18.93 with a standard deviation of 1.79 (see Table 3).

Table 3

Summary Statistics Table for Pre Knowledge, and Post Knowledge

Variable	*M*	*SD*	*n*
Pre Knowledge	12.87	2.50	15
Post Knowledge	18.93	1.79	15

To evaluate the statistical significance of the observed change in the pre-post intervention knowledge scores, a two-tailed paired samples t-test was conducted. The results demonstrated a highly significant difference between the pre- and post-intervention knowledge scores, with a t-value of -12.83 and a p-value less than .001 (see Table 4 and Figure 1). Given the p-value is below the conventional threshold of .05, the null hypothesis, that there is no difference between pre- and post-intervention knowledge was rejected. This indicates that the educational intervention had a significant positive effect on the participants' knowledge levels regarding diabetic self-care management. The effect size, represented by Cohen's d, was 3.31, indicating a large effect size. This effect size demonstrates the effectiveness of the intervention in increasing knowledge on diabetes self-management among the participants.

Table 4

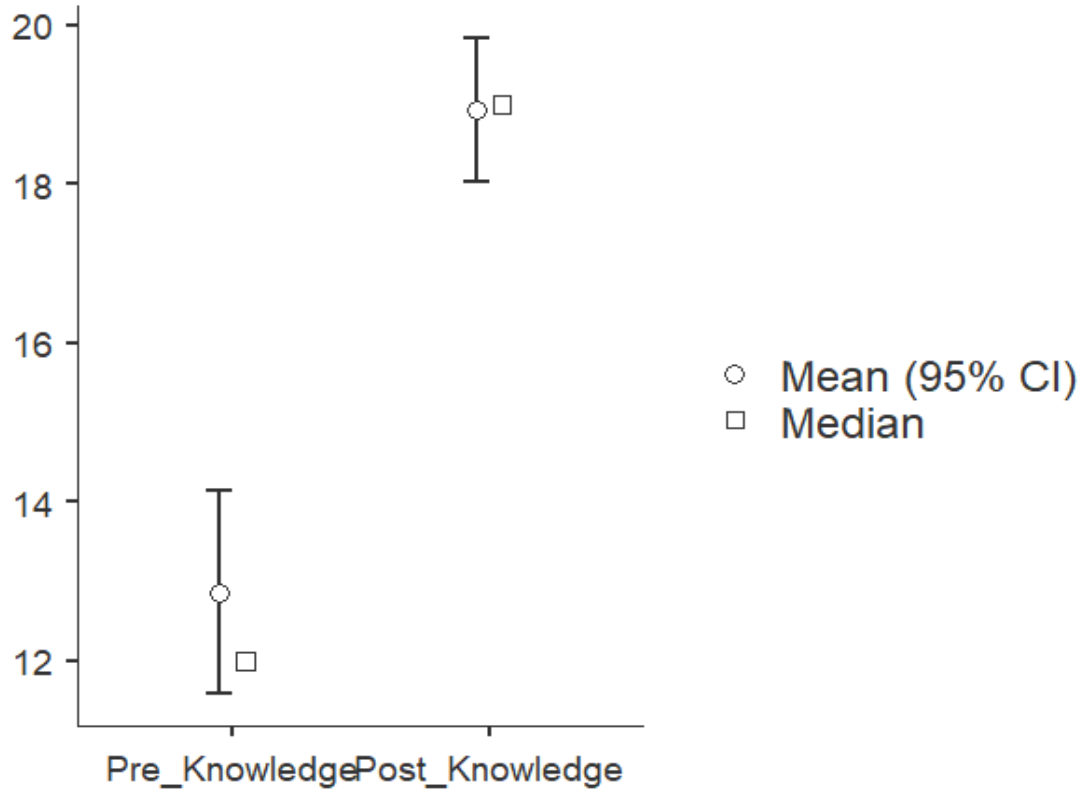
Two-Tailed Paired Samples t-Test for the Difference Between Pre-Knowledge and Post-Knowledge

Pre-Knowledge		Post-Knowledge				
M	*SD*	*M*	*SD*	*T*	*p*	*D*
12.87	2.50	18.93	1.79	-12.83	< .001	3.31

Note. N = 15. Degrees of Freedom for the *t*-statistic = 14. *d* represents Cohen's *d.*

Figure 1

The means of Pre-Knowledge and Post-Knowledge with 95.00% CI Error Bars



IX. Discussion

The purpose of this quality improvement project was to examine the effectiveness of 2022 American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES) in increasing knowledge on diabetes self-management in adults with Type 2 diabetes. The project involved 15 adult patients diagnosed with Type 2 diabetes, with a mean age of 61.13 years (SD = 9.342). The gender distribution was nearly balanced, with 53% males and 47% females of a diverse ethnic sample. The demographic data

breakdown showed a nearly equal distribution of diverse ethnic representation, with the most frequent ethnic group being African American (40.00%).

The primary outcome measure was the change in diabetes self-management knowledge from pre-test to post-test. The pre-intervention knowledge score had a mean of 12.87 (SD = 2.503), significantly lower than the post-intervention knowledge score, which had a mean of 18.93 (SD = 1.792). The findings of this project are consistent with the existing literature, which consistently demonstrates the positive impact of DSMES on patient outcomes. The studies by Lamptey et al. (2023), Mikhael et al. (2020), and Sanaeinasab et al. (2021) reported that DSMES interventions significantly improve self-management knowledge and behaviors, medication adherence, and overall quality of life. Shiferaw et al. (2021) and Tanaka et al. (2020) reported that educational interventions lead to increased disease knowledge, self-efficacy, and improved glycemic control among patients with Type 2 diabetes. The results of this project align with these studies, suggesting that the DSMES framework effectively enhances patient understanding and management of diabetes. The findings of this project stress the importance of DSMES in patient education and support, particularly in a diverse patient population. By improving patients' knowledge about diabetes management, DSMES can empower individuals to make informed decisions, adhere to recommended lifestyle changes, and ultimately achieve better health outcomes. This project contributes to the growing body of evidence supporting DSMES as an important component of diabetes care and highlights the need for continued implementation and evaluation of these programs in diverse healthcare settings.

X. Limitations

This study had several limitations. The small sample size of 15 participants limits the generalizability of the findings. The study was conducted in a single community outpatient setting, which may not represent other populations or healthcare environments. Another limitation is that only short-term changes in knowledge were assessed; long-term effects of the educational intervention on diabetes self-management behaviors and clinical outcomes were not evaluated. The reliance on self-reported data may also introduce response bias and affect the accuracy of the findings.

XI. Implications to Advanced Nursing Practice

The findings from this study hold significant implications for advanced nursing practice, particularly in the management of Type 2 diabetes through education. The implementation of the 2022 American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES) demonstrated a substantial increase in patients' knowledge of diabetes self-management, highlighting the effectiveness of structured educational interventions. This stresses the critical role that advanced practice nurses (APNs) can play in patient education and chronic disease management. The increase in diabetes self-management knowledge post-intervention suggests that APNs should integrate DSMES into routine care for patients with Type 2 Diabetes. The improvement in knowledge can lead to better glycemic control, improved quality of life, and a reduced risk of complications (Alenazi et al. 2020; Bekele et al. 2020; Lamptey et al., 2023). This project reinforces the importance of a holistic approach in nursing, which emphasizes not only medical treatment but also patient education and empowerment (Suardi et

al., 2021). APNs are in a unique position to advocate for and implement such educational programs, given their advanced training and direct patient care roles.

Knowledge improvement highlights the need for personalized education plans based on the varying demographic and clinical data of patients with Type 2 Diabetes. For instance, tailoring educational materials to address specific cultural or gender-related issues could enhance the effectiveness of DSMES. Personalized education can ensure that all patients, regardless of their background, receive the support they need to manage their condition effectively. Future research should include a larger and more diverse sample size to promote generalizability of study results.

XII. Conclusion

The aim of this quality improvement project was to increase knowledge on diabetes self-management, and ultimately glycemic control among adult patients with Type 2 diabetes in a primary care setting. The prevalence and economic burden of diabetes are significant, and the associated complications pose serious threats to patients' health and well-being. This quality improvement project aligns with the 2022 American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES), emphasizing evidence-based education to enhance self-care behaviors and improve glycemic control. A review of available literature provided a strong foundation for this project, highlighting the positive impact of DSMES on patient knowledge, self-management behaviors, and glycemic control. The reviewed studies demonstrated the effectiveness of structured self-management education interventions in increasing knowledge and outcomes for patients with Type 2 diabetes. To implement the project in the practice setting, the DNP student employed the Plan-Do-Study-Act (PDSA) cycle and a pre- and post-test quasi-experimental design. This ensured a systematic

and evidence-based approach to the implementation of DSMES. In addition, the DNP student used the Revised Brief Diabetes Knowledge Test (DKT2) to collect data on the patient's knowledge on diabetes self-management components such as nutrition, diet, blood glucose self-monitoring, physical activities, medication adherence pre and post education intervention. The anticipated outcomes of this project were increased patient knowledge on self-care behaviors, which will further result in improved glycemic control. The findings of this project identified DSMES as one of the most effective evidence-based interventions that when successfully implemented result in increased knowledge on diabetes self-management.

XIII. Dissemination Plan

According to the American Association of Colleges of Nursing (AACN, 2015), sharing the outcomes of a DNP project is crucial. This can be achieved through various methods, such as publishing an article, creating a poster, or designing another presentation format (AACN, 2015). The results of this project will be presented at the Doctor of Nursing Practice (DNP) Symposium at Florida International University. Next, the DNP candidate will design and submit a poster to the American Association of Diabetes Educators Annual Conference in 2024. The poster will also be submitted for presentation at the Sigma Theta Tau International Nursing Research Congress and the American Association of Diabetes Educators Annual Conference that will be held in 2024. For article submissions, the DNP candidate plans to submit an article to *Diabetes Care,* a journal published by the American Diabetes Association.

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Appendices

IRB Approval Letter

FIU | FLORIDA INTERNATIONAL UNIVERSITY

MEMORANDUM

To: Dr. Deborah Sherman

CC: Natacha Etienne

From: Maria Melendez-Vargas, MIBA, IRB Coordinator

Date: May 31, 2024

Protocol Title: "Implementation of Diabetes Self-Management Education to Improve Glycemic Control in Adults with Uncontrolled Type II Diabetes: A Quality Improvement Project."

The Health Sciences Institutional Review Board of Florida International University has approved your study for the use of human subjects via the **Expedited Review** process. Your study was found to be in compliance with this institution's Federal Wide Assurance (00000060).

IRB Protocol Approval #: IRB-24-0277 **IRB Approval Date:** 05/15/24

TOPAZ Reference #: 114350 **IRB Expiration Date:** 05/15/27

As a requirement of IRB Approval you are required to:

1) Submit an IRB Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved by the IRB prior to implementation.
2) Promptly submit an IRB Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/or deviations from the approved protocol.

3) Utilize copies of the date stamped consent document(s) for obtaining consent from subjects (unless waived by the IRB). Signed consent documents must be retained for at least three years after the completion of the study.
4) **Receive annual review and re-approval of your study prior to your IRB expiration date**. Submit the IRB Renewal Form at least 30 days in advance of the study's expiration date.
5) Submit an IRB Project Completion Report Form when the study is finished or discontinued.

HIPAA Privacy Rule: Satisfied

Special Conditions: N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

MMV/em

Letter of Support from Facility

Val-Das Preventive Care Clinic

Location 6835 Sunset Strip, Sunrise, FL

Contact 954-514-7422

Email vdpreventivecare@gmail.com

To Whom It May Concern

Re: Letter of Support for Natacha Etienne DNP Project

Dear Dr. Sherman

Thank you for inviting Val-Das Preventive Care Clinic in the DNP project of Natacha Etienne. I understand that as part of the requirements for the DNP program at FIU, this student will be conducting DNP project focusing in the implementation of an evidence based POCOT: Among adult patients with Type 2 diabetes in a community outpatient setting (P), will diabetes education, based on the American Diabetes Association (ADA) National Standards for Diabetes Self-Management Education and Support (DSMES) (I), as compared to current practice(C), increase knowledge on diabetes self-management (O), within 30 minutes. After reviewing the purpose of the project, I have granted Natacha the permission to implement the project in the facility.

We understand that the project will be implemented in our facility and will occur in one day. We also acknowledge that the participation of our patients will be voluntary, and they will be issued informed consent prior to attending the education session. We will provide a conducive environment that will ensure the protection of the participants privacy, and success of the project.

We also understand that prior to the implementation of the quality improvement project, the institutional review board of FIU will review, and provide approval. Our institution will not require an internal IRB approval prior to implementation because Natacha Etienne has confirmed that the project will not lead to any harm to the participants. We believe this quality improvement project will benefit

our facility as evidence suggests that the increased prevalence of uncontrolled blood glucose may be attributed to lack of adequate knowledge on diabetes selfmanagement.

We expect that Natacha Etienne will not disrupt normal staffing and will follow the facility's rules and regulations.

Please let me know if you have any questions and contact me at (786-385-3444) Sincerely,

Dr, Guerda Valere, DNP, APRN, FNP-BC, NPC

Informed Consent

ADULT CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Implementation of Diabetes Self-Management Education to Improve Glycemic Control in Adults with Uncontrolled Type II Diabetes: A Quality Improvement Project.

PURPOSE OF THE STUDY

This quality improvement project aims to improve the patients' knowledge of diabetes, by using Diabetes Self-management Education and Support (DSMES) guideline. The research design is a pre and post-test. The target population will consist of approximately 15 healthcare patients diagnosed with uncontrolled Type II diabetes and being cared for in a primary care clinic. The participants will be asked to sign a written informed consent. Before the educational intervention, participants will complete a Demographic and Clinical Data Form and the Brief Diabetes Knowledge (DKT 2) Pre-test. Following completion of the educational session, participants will then complete the DKT 2 post-test. The educational session is expected to last approximately 45 minutes. As a result of this project, the expected benefit is that participants will gain increased knowledge regarding Type II diabetes and its management. There are no expected risks associated with study participation except for test anxiety when completing the study's pre and post-test and the need to use work or family time to participate in this educational intervention. The importance of patient knowledge regarding the management of Type II diabetes may include decreasing complications of diabetes, improving patient outcomes, and increasing patient satisfaction.

NUMBER OF STUDY PARTICIPANTS

About ___15 Participants will take part in this research.

DURATION OF THE STUDY

It is anticipated that the total time commitment of participants is 105 minutes, including five minutes to sign the written informed consent, five minutes to complete the Demographic and Clinical Data Form and 15 minutes to complete the Diabetes Knowledge Pre-test, 50 minutes to attend the educational session, and 15 minutes to complete the Diabetes Knowledge Post-test.

PROCEDURES

The design for this project is a pre- and post-test quasi-experimental design. This design will involve collecting data on the participants' knowledge on diabetes self-management before the intervention, followed by the Diabetes Self-Management Education and Support (DSMES) training, and a post-test of diabetes self-knowledge after the implementation of the Diabetes Self-Management Education and Support (DSMES) intervention. If you agree to take part in this research you will be requested to fill out consent form, Demographic and Clinical Data Form (DCDF), and Revised Brief Diabetes Knowledge Test (DKT2) to test pre and post intervention knowledge on diabetes self-management. The DCDF will include information on your age, gender, ethnicity, medications, medication adherence, diet and exercise information, age of diagnosis, and HbA1c levels of the participants. The revised DKT2 has two sections. The first section contains 14 questions that cover aspects of nutrition, diet, blood glucose self-monitoring, and physical activities. The second segment contains 9 items that focus on, medication compliance, particularly insulin. You will complete the DKT2 immediately you walk into the conference room, and after the educational intervention. It will take around 15 minutes to complete the DKT2 test, pre and post intervention, totaling 30 minutes. Also, you will also be asked to attend a 50-minute diabetes self- management education and support (DSMES) session. The educational offering will include information on proper diet, appropriate food portions, physical activities, and blood sugar monitoring.

RISKS AND/OR DISCOMFORTS

There are no anticipated physical, social, legal, or economic risk associated with participating in

this study. Unexpected but potential psychological risk may include test-taking anxiety in

completing the Diabetes Knowledge Pre and Post-Test and possibly the time taken from work or family responsibilities to participate in the study. The probability of potential risk for illness or

injury is extremely low. The severity or likelihood of occurrence of risk is also expected to be extremely low. The DNP Candidate will offer support and guidance to participants in completing the study instruments and implement the educational session at a time in which most participants are free to participate based on their feedback.

BENEFITS

We cannot promise any benefits to you or others from your taking part in this research. However, possible benefits to you include a more personalized approach to your diabetes care. You will be empowered with knowledge and skills to effectively manage your condition. Other possible benefits include improved blood glucose control, reduced risk of complications, enhanced quality of life, and increased confidence in handling daily challenges associated with diabetes. A potential benefit to the patient includes an increased knowledge about Diabetes self-care.

ALTERNATIVES

There are no known alternatives available to you other than not taking part in this study.

CONFIDENTIALITY

The project follows strict confidentiality protocols to safeguard your personal and health-related information. Only authorized individuals directly involved in the project will have access to the data. Whenever possible, data will be anonymized or de-identified to further protect your privacy. The written

informed consent will be stored in a separate locked file cabinet from the Demographic and Clinical Data Forms as well as the Brief Diabetes Knowledge pre and post-tests. Only the DNP Candidate will have access to the study instruments. For data analysis, the study data will be entered into an encrypted, password protected laptop computer in the locked office of the DNP Candidate at the Clinic. Upon signing the study's written informed consent, the participant's and contact information will be kept in the Master Key along with the participants assigned code number. Only the DNP Candidate has access to the Master Key. The Master Key will be stored in a separate locked file cabinet from the study data forms to protect the confidentiality of participants.

COMPENSATION & COSTS

There is no cost or payment to you for receiving the health education and/or participating in this project.

MEDICAL TREATMENT

The quality improvement project involves minimal risks and will not hurt you. However, there are possible risks or discomforts that you might experience such as sharing personal information about your health and experiences. Additionally, while every effort will be made to maintain confidentiality, there is a slight risk of privacy concerns. The educational workshop might touch on various aspects of diabetes care, including lifestyle changes. You may experience some discomfort if these activities challenge your existing beliefs or habits.

RIGHT TO DECLINE OR WITHDRAW

Your participation in this project is voluntary. You are free to participate in the project or withdraw your consent at any time during the project. Your withdrawal or lack of participation will not affect any benefits to which you are otherwise entitled. The investigator reserves the right to remove you without your consent at such time that they feel it is in the best interest.

RESEARCHER CONTACT INFORMATION

For any questions or concerns about this project, you can the DNP candidate using the phone number +1561768223 or email netie023@fiu.edu. I am available to assist you and address any inquiries you may have regarding your participation, the project's goals, or any other relevant information. If you are unsure about whom to contact, you can also ask your healthcare providers for assistance. They can direct you to the appropriate person or provide you with the necessary contact details.

Your comfort and understanding are important, so please don't hesitate to reach out if you have any questions.

IRB CONTACT INFORMATION

If you would like to talk with someone about your rights of being a subject in this research study or about ethical issues with this research study, you may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu.

PARTICIPANT AGREEMENT

I have read the information in this consent form and agree to participate in this study. I have had a chance to ask any questions I have about this study, and they have been answered for me. I understand that I will be given a copy of this form for my records.

_____ _____

Signature of Participant Date

_____

Printed Name of Participant

_____ _____

Signature of Person Obtaining Consent Date

Recruitment Flyer

DIABETES MANAGEMENT

A Quality Improvement Project

Are you an adult with Type 2 Diabetes? We're excited to introduce our new Diabetes Self-Management Education and Support (DSMES) program to help you take control of your health and achieve optimal well-being!

- What does the participation entail
- Fill out written consent form.
- Complete Demographic and Clinical Data Form.
- Take pre-posttest* regarding knowledge on diabetes self-management (15 minutes).
- Attend educational sessions on diabetes self-management (1 hour).
- Complete the post-test (15 minutes) regarding diabetes self-management.
-

Program Date: Monday, June 10, 2024 at 9:00 AM
Location: VAL-DAS Preventive Care Clinic

Enroll Today

Education Program

Appropriate diet, meal planning, and carbohydrate counting

Expert guidance on physical activities

Expert guidance on glucose monitoring

Enroll Today! Contact us:
Name: Natacha Etienne FNP-BC, ARNP.
Contact: +1 (561) 768-3223
Position: Florida International University Doctor of Nursing Practice (DNP) Candidate

Revised Brief Diabetes Knowledge Test (DKT2)

Michigan Diabetes Research and Training Center's Revised Diabetes Knowledge Test[a]

1. The diabetes diet is: a. the way most American people eat b.[b] a healthy diet for most people c. too high in carbohydrate for most people d. too high in protein for most people	9. For a person in good control, what effect does exercise have on blood glucose? a.[b] Lowers it b. Raises it c. Has no effect	17. If you have taken rapid-acting insulin, you are most likely to have a low blood glucose reaction in: a.[b] Less than 2 hours b. 3-5 hours c. 6-12 hours d. More than 13 hours
2. Which of the following is highest in carbohydrate? a. Baked chicken b. Swiss cheese c.[b] Baked potato d. Peanut butter	10. What effect will an infection most likely have on blood glucose? a. Lowers it b.[b] Raises it c. Has no effect	18. You realize just before lunch that you forgot to take your insulin at breakfast. What should you do now? a. Skip lunch to lower your blood glucose b. Take the insulin that you usually take at breakfast c. Take twice as much insulin as you usually take at breakfast d.[b] Check your blood glucose level to decide how much insulin to take
3. Which of the following is highest in fat? a.[b] Low fat (2%) milk b. Orange juice c. Corn d. Honey	11. The best way to take care of your feet is to: a.[b] look at and wash them each day b. massage them with alcohol each day c. soak them for 1 hour each day d. buy shoes a size larger than usual	19. If you are beginning to have a low blood glucose reaction, you should: a. exercise b. lie down and rest c.[b] drink some juice d. take rapid-acting insulin
4. Which of the following is a "free food"? a. Any unsweetened food b. Any food that has "fat free" on the label c. Any food that has "sugar free" on the label d.[b] Any food that has less than 20 calories per serving	12. Eating foods lower in fat decreases your risk for: a. nerve disease b. kidney disease c.[b] heart disease d. eye disease	20. A low blood glucose reaction may be caused by: a.[b] too much insulin b. too little insulin c. too much food d. too little exercise
5. A1C is a measure of your average blood glucose level for the past: a. day b. week c.[b] 6-12 weeks d. 6 months	13. Numbness and tingling may be symptoms of: a. kidney disease b.[b] nerve disease c. eye disease d. liver disease	21. If you take your morning insulin but skip breakfast, your blood glucose level will usually: a. increase b.[b] decrease c. remain the same
6. Which is the best method for home glucose testing? a. Urine testing b.[b] Blood testing c. Both are equally good	14. Which of the following is usually <u>not</u> associated with diabetes: a. vision problems b. kidney problems c. nerve problems d.[b] lung problems	22. High blood glucose may be caused by: a.[b] not enough insulin b. skipping meals c. delaying your snack d. skipping your exercise
		(continued)

Table 5

(continued)

7. What effect does unsweetened fruit juice have on blood glucose? a. Lowers it b.[b] Raises it c. Has no effect	15. Signs of ketoacidosis (DKA) include: a. shakiness b. sweating c.[b] vomiting d. low blood glucose	23. A low blood glucose reaction may be caused by: a.[b] heavy exercise b. infection c. overeating d. not taking your insulin
8. Which should <u>not</u> be used to treat a low blood glucose? a. 3 hard candies b. 1/2 cup orange juice c.[b] 1 cup diet soft drink d. 1 cup skim milk	16. If you are sick with the flu, you should: a. Take less insulin b. Drink less liquids c. Eat more proteins d.[b] Test blood glucose more often	

[a]For non-US patient populations, we recommend reviewing the terms used in items 1, 2, 3, 4, and 8 for appropriateness.
[b]Correct answer.

Demographic and Clinical Data Form for Diabetic Patients

Patient Information:

Patient ID: _____

Date of Birth: _____

Gender: [ ] Male [ ] Female [ ] Other

Ethnicity: _____

Clinical History:

Age at Diagnosis: _____

Current HbA1c Level: _____

(Most recent measurement)

Duration of Diabetes: _____

(Years since diagnosis)

Medication Adherence:

Are you currently taking prescribed medications for diabetes?

[ ] Yes [ ] No

If yes, please list the medications and dosage:

Medication 1: _____ Dosage: _____

Medication 2: _____ Dosage: _____

Medication 3: _____ Dosage: _____

Diet and Exercise:

How would you describe your adherence to the recommended diet plan?

[ ] Excellent [ ] Good [ ] Fair [ ] Poor

Please provide a brief description of your typical daily diet:

_____

How often do you engage in physical exercise?

[ ] Daily [ ] 3-4 times a week [ ] 1-2 times a week [ ] Rarely [ ] Never