Health Coaching to Improve Glycemic Control Among Patients with Type 2 Diabetes

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Abstract

In the United States (US), Type 2 diabetes (T2DM) is a significant public health issue facing many patients in primary care settings. Diabetes in the US is classified as the seventh top root cause of mortality, and T2DM accounts for approximately 90-95% of diagnosed cases in adults. This DNP quality improvement project aimed to determine the efficacy of a health coaching intervention using the 2023 6th guideline of American Diabetes Association (ADA) Standards of Care to help improve glycemic levels from 22% to 37% over a 4-week time frame. Glucose level data was collected weekly, and SPSS version 29 software was used to analyze the data. A paired t-test showed a statistically significant difference in the glucose levels before and after implementing health coaching (t = 126.51, df = 9, p = 0.01, SD = 2.37). The mean difference between the pre-intervention and post-intervention glucose levels was 94.71 mmHg, implying a statistically significant decrease in blood glucose levels. There was an improvement in blood glucose control, represented by 34.13%, within the projected improvement in glycemic levels of 22.03% to 37%. The implementation of health coaching resulted in a decrease in average blood glucose levels, particularly evident in the third and fourth weeks. The statistical analysis suggests that health coaching significantly and positively affected average daily blood glucose levels.

Key Terms: Type 2 diabetes (T2DM), health coaching American, Diabetes Association (ADA) Standards of Care, blood glucose control, quality improvement (QI), lifestyle modification strategies.

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Health Coaching to Improve Glycemic Control Among Patients with Type 2 Diabetes

Introduction

In the United States (US), type 2 diabetes (T2DM) is a significant public health issue facing many patients in primary care settings. According to the Centers for Disease Control and Prevention ([CDC], 2022), diabetes in the US is classified as the seventh root cause of mortality. T2DM accounts for approximately 90-95% of diagnosed cases in US adults (CDC, 2022). T2DM is a multisystem metabolic syndrome resulting from an insufficient insulin response. The risk factors for T2DM include age, gender, race, weight, medical history, and family history of diabetes (Pinkhasova et al., 2021). According to the American Diabetes Association ([ADA], 2022), one in every four persons in the US diagnosed with T2DM has safety issues such as impaired vision, difficulty in walking, lack of transportation, and lack of adequate support from caregivers. T2DM can adversely impact self-management, leading to complications affecting their quality of life.

Despite initiatives in diabetes care, the management of diabetes has not been adequate at the project site due to a lack of satisfactory patient education on lifestyle modification strategies by providers (physician assistants and nurse practitioners), registered nurses (RNs), and licensed vocational nurses (LVNs). The ADA recommends a glycemic control level above 7% as a target for optimal blood glucose control and pre-prandial capillary plasma glucose of 80–130 mg/dl (ElSayed et al., 2023a). However, the project practice setting has been experiencing poor glycemic control in its patients. The project site's Healthcare Effectiveness Data and Information Set (HEDIS) measurement for performance is 22.03% for the patients who meet goals for control of blood sugar, blood pressure, and cholesterol. However, this measure is below the threshold of 37%, which concerns the clinic. HEDIS requirements for diabetes measure the percentage of plan members who have their blood glucose in control, the percentage of plan members who are in poor control, and plan members missing test results for blood glucose levels.

Poor adherence to all three glycemic controls has resulted in increased complications like heart disease, stroke, chronic kidney disease, renal system damage (nephropathy), and eye damage (retinopathy); these are significant concerns for the diabetic population and healthcare providers at the clinical site. However, evidence indicates that proper health coaching by providers, RNs, and LVNs regarding physical activity and adequate nutrition is essential in the Care of patients with T2DM (Garcia-Molina et al., 2020). Through health coaching, NPs, RNs, and LVNs can help T2DM patients lower their blood glucose, control insulin resistance, and reduce diabetic-related complications (Lin et al., 2021). These lifestyle modification strategies can also reduce blood glucose levels independent of body weight.

Evidence indicates that lifestyle modifications like intensive nutritional intervention and exercise are the best strategies to enhance glycemic control in T2DM patients (Cífková, 2023). Further evidence shows that patients with T2DM experience improved health outcomes with diabetes knowledge and self-efficacy to support positive self-management (Sullivan et al., 2019). Health coaching as an intervention emphasizes self-management, empowering patients to set healthy goals, and providing support through weekly reminders to enhance self-management for patients with T2DM (Pinkhasova et al., 2021) and short intervals of clinic visit follow-up to monitor blood glucose levels.

The project lead and team (medical director, nurse leaders, and clinic manager) adhered to the 2023 6th ADA Standards of Care guideline to meet optimal glycemic levels (ElSayed et al., 2023b). The proposed project intended to educate healthcare providers, RNs, and LVNs to provide health coaching to patients with T2DM to increase adherence to lifestyle modifications such as diet and exercise routines to improve glycemic control using ADA Standards of Care guidelines.

Significance of the Problem

Inadequate education about lifestyle modifications has long been a barrier to achieving glycemic control. A study by Lin et al. (2021) that implemented a health coaching protocol

reported that blood glucose levels were enhanced with more gainful steps in participants who received health coaching over the control group. Moreover, patients who received health coaching from trained healthcare providers were twice as likely to attain glycemic control than those who never received the intervention (Lin et al., 2021). Therefore, implementing an evidence-based health coaching intervention is expected to benefit the practice setting in enhancing glycemic control among T2DM patients (Garcia-Molina et al., 2020). Education through health coaching provided the means to support improved self-care management.

Implementing this quality improvement (QI.) DNP project, the healthcare providers, RNs, and LVNs caring for T2DM patients had the opportunity to show the importance of lifestyle modification and self-management support with interactive follow-up after clinical visit discharge. Through health coaching, patients may increase motivation and confidence, thus increasing their self-efficacy, experiencing better self-care management, and reducing unplanned hospital expenses. Moreover, promoting self-monitoring of blood glucose via health coaching ensures that patients are engaged in their Care and make health-promoting choices by prompting them to recognize abnormal glucose readings and correlate them with their food choices and physical activity patterns. Again, patient involvement in their care keeps them informed and happy and likely enhances compliance with the intervention.

Background

In the US, diabetes is increasing at an alarming rate. According to the CDC's National Diabetes Statistics Report (2022), the prevalence of diabetes has risen to approximately 37.3 million. In addition, T2DM is a significant health concern in primary care clinics, especially among older adults. T2DM affects not only the individual diagnosed with the illness but also society. In the US, the number of persons diagnosed with diabetes has tripled in the past decade (ADA, 2022). According to the CDC (2022), more than 130 million adults live with diabetes or prediabetes in the US, and every year, about 1.4 million persons in the US are diagnosed with diabetes. The prevalence rate of diabetes has been growing due to obesity, poor diets, and lack of

physical activity, among other factors, leading to a more than three-fold increase in the number of adults living with diabetes in the Americas in the past 30 years (Pan American Health Organization [PAHO], 2022).

Lifestyle, behavior modification, and medication adherence are needed to control glucose levels (ElSayed et al., 2023b). Most T2DM care is self-managed, but it requires education and health coaching, such as repeated reminders, to enhance adherence to lifestyle modifications (Sullivan et al., 2019). Health coaching and support from care providers are essential in implementing successful behavior modification to control glycemic levels to optimal (Garcia-Molina et al., 2020). Health coaching is a partnership with a person to influence behavioral modifications, health care education, support, and goal setting to promote optimal well-being (Cai & Islam, 2023). Health coaching promotes self-care and behavioral changes and provides frequent follow-up and support (Davies et al., 2022). The health coaching protocol is progressively used in different healthcare settings as a diabetes self-management intervention strategy. Through health coaching, healthcare providers, RNs, and LVNs can educate patients to address their psychosocial well-being in addition to focusing on glucose management and physical health (Cai & Islam, 2023). Evidence shows that health coaching is an efficient intervention for improving glycemic control among patients with T2DM.

In this clinical practice setting, glycemic control among T2DM patients has become problematic for the past year due to insufficient education on lifestyle modification strategies and patient follow-up by providers, RNs, and LVNs. Glycemic control denotes a blood sugar level of less than 140 mg/dL (7.8 mmol/L) to prevent the onset and development of microvascular diabetes-related complications (Garcia-Molina et al., 2020). Optimal glycemic control is linked to reduced diabetic-related complications and enhanced health outcomes. Given the complexity of diabetic control, most patients at the clinical site experience inadequate glycemic control; this lack of glycemic control results in a disproportional burden of diabetic complications. Glycemic control depends on a high level of health literacy, self-care management education, and

medication adherence (ADA, 2022). However, the providers at the project site lack enough time for patient education on lifestyle modification strategies, leading to various diabetes-related complications. Therefore, through health coaching and adequate patient education time, patients were better informed on diabetes self-care to encourage glycemic control, thus preventing them from developing diabetes complications earlier. This QI project proposal aims to determine the efficacy of health coaching as a strategy to improve glycemic control among healthcare providers caring for patients with T2DM.

Project Question

The PICOT Question

Evidence-based practice uses the best scientific evidence to support clinical decision-making. A systematic method to guide the development of a well-designed clinical inquiry is crucial in finding the most relevant scientific research available (Portney, 2020). The clinical question that drives this DNP project is: Among the providers, RNs, and LVNs who care for patients with T2DM in primary care, what is the efficacy of health coaching intervention compared to usual care in improving glycemic levels to a threshold of 37% in 4 weeks?

P: Providers, registered nurses (RNs), and licensed vocational nurses (LVNs) who care for patients with T2DM in primary care.

I: Health coaching evidence-based protocol

C: Usual care/Inadequate lifestyle modification education.

O: Improved glycemic controls between 22.03% and 37%.

T: 4 weeks

Search Methods

The project lead established a search strategy based on the PICOT question to identify relevant literature within multiple databases. As such, a comprehensive literature review was conducted using key databases such as PubMed, CINAHL, Cochrane Database, Google Scholar search engine, and MEDLINE. The search also incorporated recommendations from the

American Diabetes Association (ADA). The search was conducted for articles published from 2018 to 2023. The search terms included combinations of key terms such as diabetes, diabetes education program, health literacy, type 2 diabetes, health coaching, glycemic control, standards of Care in diabetes, and primary Care. Articles describing quantitative and qualitative research were generated using these search terms. The search was narrowed to 30 eligible studies. A careful analysis of each article suggested ten articles that were most relevant to diabetes health coaching and glycemic control.

To be included, studies had to incorporate participants above 18 years old, be written in English, and be published in a peer-reviewed journal. The articles also had to be full-text articles and articles that investigated health coaching among T2DM adult patients, diabetes education, hypoglycemic control to reduce complications, nutrition therapy, and physical activity. Studies were excluded if they reported data on participants younger than 18 who did not have type 2 diabetes. The studies were excluded if health coaching was not the primary intervention or were pilot or feasibility trials. The duplicate research articles were automatically identified and eliminated. Abstracts were excluded because they did not have full texts due to concerns about suboptimal bias assessment. Studies with type 1 diabetes population were also excluded. Finally, studies with other interventions other than lifestyle modifications were excluded.

Review of Study Methods

Most of the study methods employed in the literature were pretest-posttest research designs for evaluating provider knowledge of T2DM before and after a standardized education session (Lin et al., 2021). Most of these studies were randomized controlled trials designed to evaluate the effectiveness of health coaching interventions on patients' blood sugar management and healthy diet by certified coaches (Hohberg et al., 2022). The aims were to enhance patients' healthy diets and improve glycemic control (Davies et al., 2022). The study participants were T2DM patients aged 18 years and above educated by certified healthcare professionals (Hohberg et al., 2022).

Participants in the intervention group received in-person coaching followed by telephone coaching (Dwinger et al., 2020). Coaching was provided on a one-on-one basis by a professional health coach (Hohberg et al., 2022). For instance, Sherifali et al. (2021) conducted a community-based, randomized, controlled trial involving adults with T2DM and uncontrolled glycemic levels. These patients were assigned to usual diabetes education (DE) and telephone diabetes health coaching (DHC) intervention on glycemic control in persons living with T2DM for the control and intervention groups, respectively. In Dwinger et al. (2020), the authors conducted randomized control trials with randomized wait list controls and matched controls among patients with type 2 diabetes and uncontrolled glycemic levels. In a study by Sullivan et al. (2019), the patients with T2DM participated in a face-to-face semi-structured interview in the health-coaching program that included a pre- and post-diabetes Education Quiz.

Review Synthesis

T2DM continues to be a chronic disease managed by healthcare providers in the primary care setting (ADA, 2022). A comprehensive literature review was conducted to understand how to improve T2DM providers' knowledge and patient self-care in Primary Care through health coaching to improve glycemic control and prevent complications (Lin et al., 2021). The studies reviewed showed that experts in the field of T2DM, such as diabetes educators, can serve as diabetes teaching coaches for patients with T2DM throughout planned sessions. The literature revealed that health coaching intervention significantly improved T2DM patients' glycemic control levels and healthy diet behavior (Davies et al., 2022). The literature also revealed that theoretical knowledge about diabetes management was statistically significant because of a correlation between coaching, education, and knowledge (Irnawan & Syahrul, 2020). Therefore, health coaching on patients' knowledge about lifestyle modifications may improve glycemic control and reduce diabetes-related complications in the practice setting (Lin et al., 2021). More importantly, all the studies reviewed offered some form of diabetes education for individuals with diabetes and clinical staff members (Garcia-Molina et al., 2020).

Impact of the Problem

Inadequate education in lifestyle modification influences how patients behaviorally react to T2DM. The limited and time-constrained knowledge concerning T2DM management provided by providers to patients contributes to this chronic illness's negative impact on those who live with it. Limited diabetic understanding also leads to poor glucose control and increased morbidity and motility (Pinkhasova et al., 2021). Health coaching on lifestyle modifications is essential in glycemic control, thus controlling diabetic complications. Besides, diabetes education by healthcare providers increases the patients' self-efficacy, which is crucial in adjusting lifestyles like diet intake in managing T2DM. For instance, the limited knowledge, cultural practices, financial constraints, and low formal education often results in poor dietary practices, negatively affecting T2DM management (Pinkhasova et al., 2021). This problem highlights the importance of education on lifestyle modification by providers to help patients and the community manage T2DM and prevent complications.

Addressing the Problem with Current Evidence

A review of the ADA (2023) 3rd guideline on the Prevention or Delay of T2DM and Associated Comorbidities provided the protocol to follow for this DNP Quality Improvement (QI) project (ElSayed et al., 2023b). Most of the reviewed studies were conducted to improve overall glycemic control and self-care management skills through educational classes and coaching of providers as the best evidence-based practice (EBP) (Sullivan et al., 2019). According to Lin et al. (2021) and Sherifali et al. (2021), health is conducive to blood sugar control and a healthy diet of patients with T2DM.

On the other hand, according to Davies et al. (2022), lifestyle modifications such as physical activity and nutrition significantly impact cardiometabolic health in T2DM patients. The researchers also found that regular aerobic exercise improves glycemic management in adults with T2DM, resulting in few complications. Moreover, Irnawan and Syahrul (2020) noted that the coaching method is promising to improve glycemic control in patients with T2DM. These

themes addressed the gap that existed in the practice site. The quality gap in practice that leads to suboptimal Care is that glycemic control among T2DM patients has become problematic due to inadequate patient education on lifestyle modification strategies and provider follow-up (Hohberg et al., 2022). This gap in practice has contributed to various diabetes-related complications such as heart disease, stroke, chronic kidney disease, and renal system damage.

Theme Development

Several major themes emerged from reviewing the literature, and they incorporated health coaching, lifestyle modifications (physical activity and nutrition), and glycemic control.

Health Coaching. Recently, health coaching has emerged as an effective intervention to support diabetes self-management. According to Racey et al. (2022), health coaching is patient-centered Care that incorporates patient-determined goals and includes self-discovery and active learning processes that encourage accountability for behavioral goals while providing some education alongside coaching. It is conducted by a health professional trained in behavior change, communication, and motivational interviewing skills. Health coaching may also be timely and relevant to health-related education, behavior change promotion, and psychosocial support to enhance the well-being of individuals and facilitate the achievement of their health-related goals. According to Sullivan et al. (2019), health coaching focuses on self-management, empowers patients to set healthy goals, and provides support through weekly reminders to improve self-management for patients with T2DM.

Health coaching aims to induce a lasting change in the behaviors and habits of diabetes patients. In a community-based randomized controlled trial, Sherifali et al. (2021) noted that health coaching for T2DM represents a promising addition to improving clinical health outcomes and quality of life. Racey et al. (2022) also state that the rationale for health coaching intervention is to directly affect or influence glycemic control and diabetes management via other self-care behaviors and decreasing risk factors. Case managers have the opportunity to coach on the importance of lifestyle modification and self-management support for patients with chronic

illness with follow-up interactive phone visits after hospital discharge. Motivation and confidence through coaching may increase self-efficacy and better management of self-care and reduce the burden of unplanned hospital readmissions.

Various health coaching techniques, such as face-to-face and telephone health coaching, are recommended and can be conducted by nurses who have attended training for health coaches to facilitate and empower patients to achieve self-determined goals related to diabetes management. Lin et al. (2021) found that health coaching effectively enhances a healthy diet because it can substantially decrease daily calorie intake and food intake while improving the intake of vegetables, which aligns with ADA's health education guidelines for diabetes.

Lifestyle modifications. Lifestyle modification is altering long-term habits, especially eating or physical activity, and maintaining a newly acquired behavior for months or even years. According to Sullivan et al. (2029), lifestyle modification and medication adherence are required for glycemic control among diabetic patients. Most T2DM care is self-managed but may need education and health coaching, including repeated reminders to enhance adherence to the medication regimen and lifestyle modifications due to the burden of this chronic condition. Therefore, health coaching and support from case managers are essential in implementing successful lifestyle modification strategies like diet and physical activity. According to Radwan (2019), a healthy lifestyle is vital during patient care and assists in deterring several lifestyle diseases associated with T2DM that have dramatically increased in recent years.

According to Burton and Thompson (2018), coaching programs are helpful when a patient's condition can be improved through lifestyle modifications where the diabetes patients learn new approaches for monitoring and managing their everyday health, such as through eating healthy diets, exercising moderately, or adhering to their medication regimens. Patel and Keyes (2023) noted that a lifestyle modification intervention comprising a low-calorie and low-fat diet and moderate-intensity exercise for 150 minutes every week led to a 67% decrease in the risk of developing T2DM. Further evidence shows that individuals who maintain a physically active

lifestyle suffer from impaired glucose tolerance and T2DM less often than people living a sedentary lifestyle. Moreover, lifestyle modification must also emphasize increasing physical activity, which enhances insulin sensitivity independent of the effect on BMI.

According to the 2023 Standards of Medical Care in Diabetes by the ADA, an individual's motivation, life circumstances, and willingness to make lifestyle changes to achieve weight loss needs to be assessed along with medical status when weight loss interventions are undertaken (ElSayed et al., 2023a). According to the CDC (2022), lifestyle changes that result in modest and sustained weight loss result in a clinically significant decrease in blood glucose and A1C. Effective weight loss through lifestyle modification results in even more excellent benefits, incorporating decreases in blood pressure and decreases in the need for medication adherence to control blood glucose, and may result in the attainment of glycemic goals without using glucose-lowering agent insulin. Davies et al. (2022) also noted that structured nutrition and lifestyle programs are effective for glycemic control. Garcia-Molina et al. (2020) also found that lifestyle interventions considerably lowered glycemic levels compared to the usual Care for patients with T2DM.

Glycemic Control. Poor glycemic control has become a significant public health concern among T2DM patients and the leading cause of the development of diabetes-associated complications. Glycemic control refers to the optimal serum glucose concentration in a diabetic patient (ElSayed et al., 2023b). It involves regulating and maintaining blood glucose levels within the normal range (Shita & Iyasu, 2022). It is often done by measuring fasting blood glucose, applying an oral glucose tolerance test (OGTT), and measuring glycohemoglobin (ElSayed et al., 2023b). Evidence indicates that over 75% of US adults with T2DM do not meet all glycemic treatment targets (Rosland et al., 2022). Often, these patients require more intensive monitoring and support than health systems can offer. However, health coaching among T2DM patients is relatively inexpensive and benefits the patient through education on managing, treating, and

preventing T2DM (Rosland et al., 2022). Notably, it is essential to identify the factors that affect the glycemic control of patients to avoid complications that may arise from uncontrollable levels.

Many factors, such as diabetes management, like nutrition, physical activity, knowledge, and compliance with treatment, can influence the glycemic control level. According to Irnawan and Syahrul (2020), health coaching can be utilized as a complementary intervention in diabetes management to control glycemic. Irnawan and Syahrul (2020) noted that health coaching significantly improved glycemic control. In a retrospective cohort study by Shita and Iyasu (2022), the authors aimed to assess glycemic control status and its associated factors among T2DM patients. The authors used a sample of 191 patients and noted an overall prevalence of poor glycemic control at 58.4% (Shita & Iyasu, 2022). According to Shita and Iyasu (2022), the factors associated with poor glycemic control included residing in rural areas, being older than 67 years, having positive proteinuria, having a weight of 78 kg or higher, increasing serum creatinine levels, and having hypertension.

Evidence Gaps and Controversies. The quality gap in practice that leads to suboptimal Care is that glycemic control among T2DM patients has become problematic due to inadequate provider knowledge of lifestyle modification strategies and patient follow-up (Hohberg et al., 2022). This gap in practice has contributed to various diabetes-related complications such as heart disease, stroke, chronic kidney disease, and renal system damage.

Project Aims

This DNP scholarly project aimed to determine the effectiveness of health coaching by providers (physician assistants and nurse practitioners), registered nurses (RNs), and licensed vocational nurses (LVNs) caring for type 2 diabetes mellitus (T2DM) patients to increase knowledge about lifestyle modifications, improve glycemic control, and reduce diabetes-related complications. The goal was to enhance provider knowledge to educate patients and help them meet glycemic control to decrease long-term complications among patients with T2DM.

Project Objectives

In the timeframe of this DNP Project, the host site:

1. Implemented health coaching protocol aligned with ADA diabetes education recommendations for healthcare providers caring for T2DM patients to enhance glycemic control.
2. Improved glycemic controls between 22.03% and 37%.
3. Educated RNs and LVNs to increase knowledge about health coaching protocol utilizing a PowerPoint presentation.

Implementation Framework

The Plan-Do-Study-Act (PDSA) cycle (See Appendix A) was used to evaluate the change process in diabetes care using lifestyle modification strategies. The PDSA model advocates the formation of a hypothesis for improvement (Plan), a study protocol with the collection of data (Do), analysis and interpretation of the results (Study), and the iteration for what to do next (Act) (Robinson et al., 2022). The PDSA method is a way to test a change that is being implemented (England, 2021). The process also allows the project team to comprehensively review the changes and evaluate any potential issues before the implementation. In short, the PDSA cycle was designed to test and implement changes in natural work settings by planning a change, pushing the change, observing the outcomes, and acting on what is learned before embarking on a full-scale implementation. Walter Shewart and Edward Deming introduced the PDSA model in the 1920s (England, 2021). The model formed the basis of an approach to organizational development and leadership.

Application to DNP Project

Using the PDSA cycles, the project lead tested the intervention by conducting health coaching on a small scale, building on the learning from test cycles in a structured way before embarking on the actual implementation (Robinson et al., 2022). This test allowed the project team to see if the health coaching would succeed in increasing provider knowledge about lifestyle modifications to enhance glycemic control n and reduce diabetes-related complications; this was

a powerful tool for learning from ideas that do and those that do not work. This way, the change process is safer and less disruptive for healthcare providers.

Plan

This is the initial stage of the PDSA cycle and involves developing a plan to test the identified health coaching intervention (Connelly, 2021). An interdisciplinary team of key stakeholders was also recognized for this quality improvement project; the healthcare providers documented the current glycemic control process.

Do

The do stage involved identifying the steps in a quality improvement plan and testing the change on a small scale (Connelly, 2021). The project team determined if the healthcare providers are following lifestyle modification education and determine whether glycemic levels are under control. Suppose glycemic levels are not under control and several complications are identified. In that case, the project team reported to the nurse manager that health coaching was necessary to educate healthcare providers on diabetes management through lifestyle modifications.

Study

The study stage of the PDSA cycle involved analyzing the collected data and summarizing what was learned throughout the test change (Robinson et al., 2022). For this QI project, data was collected on glycemic scores. The data was analyzed and determined if the process change resulted in the expected outcome of improving glycemic control (Robinson et al., 2022).

Act

In the act stage, modifications were made to refine the process change based on examining the results and what was learned from the test (Connelly, 2021). In this stage, the project team evaluated the process change's successful elements and modified the test change if required before implementing the next PDSA cycle (Robinson et al., 2022). The PDSA process

was then repeated until the project aim was attained. For the initial PDSA cycle, this would be represented by increased blood glucose control after following health coaching protocol and an increased knowledge score about lifestyle modifications, resulting in improved glycemic control.

Population of Interest

This DNP project's target population of interest was nurses working in primary care clinics and caring for type 2 diabetes (T2DM) patients. They were responsible for implementing the program. The project's participants were recruited following the inclusion and exclusion criteria of the project. The inclusion criteria were the following: Family Medicine Primary care provider for T2DM patients, use English as the primary language, are educated up to master's degree level, and have worked at the clinical site for at least three years.

The direct population included six nurse practitioners (NP), three registered nurses (RN), and six licensed vocational nurses (LVNs). The selected nurses received education in the form of health coaching regarding prediabetes, diabetes, and diabetes prevention using lifestyle modifications. The primary care clinicians implemented and evaluated the program. The primary care clinic nurses/medical staff also used the project material when educating the patients with prediabetes and those with type 2 diabetes. The indirect population was patients with T2DM who received education on lifestyle modification strategies. The health coaching intervention improved patient health outcomes, such as controlled fasting glucose levels, resulting in glycemic control. Healthcare providers were excluded if they were not permanently employed at the facility, were not family practice care providers for T2DM patients, and were not fluent in English. The auxiliary staff, such as office administrators and therapists, were excluded.

Setting

This project was conducted in a Los Angeles non-profit, Federally Qualified Health Care primary clinic. The primary care setting is a network of clinics in Los Angeles providing medical, dental, mental health, and substance use services, case management, supportive services, and outreach services (St. John's Community Health, 2023). The clinic offers health clinics to low-

income, uninsured, undocumented, and underinsured people. The clinic is a general acute and chronic care facility in Los Angeles. The mission is to improve community health and reduce health disparities by delivering high-quality, comprehensive services and impacting health and social policy (St. John's Community Health, 2023). On average, 20 patients are seen in the primary care clinic.

In a needs assessment of the primary care clinic, it was found that a high number of patients had uncontrolled glycemic levels and an increased number with type 2 diabetes (T2DM) due to inadequate education of patients by medical staff such as nurse practitioners, registered nurses, licensed vocational nurses, etc., to follow lifestyle modifications protocol. The primary care clinic lacks staff or time to educate patients on lifestyle modifications and lacks practice protocols to control glycemic levels and manage patients with T2DM. A discussion with the quality improvement director/ manager led to the need to plan the implementation and evaluation of a health coaching intervention to control glycemic levels and manage T2DM in the primary care clinic.

The intervention spanned four weeks of weekly sessions. Due to this quality improvement project (QI) involving health coaching, the DNP student and the participants met twice at their primary care offices for the pre- post-intervention measurements. No permission was required to implement this DNP project at the clinical site. The clinic has an EHR system that records age, gender, ethnicity, health history, medicines, allergies, immunization status, lab test results, hospital discharge instructions, and billing information. The system also recorded the staff employed at the clinic.

Stakeholders

Stakeholder support is essential for implementing a successful change proposal project (Albers et al., 2020). It is crucial to consider internal stakeholders, such as the facility, unit, or healthcare setting, and external stakeholders, like individuals or groups outside the healthcare setting (Albers et al., 2020). The key internal stakeholders in this project included the DNP

student, QI director/manager, nurse managers, frontline nurse practitioners (NPs), registered nurses (RNs), and licensed vocational nurses (LVNs).

Even though the QI manager is not part of the direct population, she is the knowledge expert for continuous improvement activities in all the clinical, functional, and administrative areas (Ozkaynak et al., 2022). The QI manager monitored different department processes, such as care complaints and medical record assessments, to recommend actions to address any risks or vulnerabilities. The QI manager also led the implementation efforts within the department where the intervention was implemented, and the role is central to proactively monitoring the progress of this DNP scholarly project at the clinic. The QI manager ensured quality remained atop the clinic's agenda; thus, getting her opinion on health coaching before launching the initiative at her clinic was essential.

The NPs, RNs, and LVNs helped collect data on daily glucose levels, while the nurse manager collected data regarding blood glucose logs from the patients who adhere to lifestyle modifications. The actions of the frontline nurses reflect directly on the clinic's vision, mission, culture, and values (Sela et al., 2022). Nurse practitioners (NPs), RNs, and LVNs are essential in promoting self-management practices among T2DM patients. They are the first point of contact for people newly diagnosed with diabetes and are vital for the success of this DNP scholarly project. These frontline nurses also offered valuable dietary and lifestyle advice to help individuals with type 2 diabetes to help reduce complications and raise awareness of the illness. More importantly, these healthcare providers are typically involved in coordinating the ongoing Care of patients, educating and counseling, and providing advice on medication and managing inter-current illness (Sela et al., 2022).

In consultation with the DNP student, nurse managers who act as educators for the target population conducted the health coaching of NPs, RNs, and LVNs. The NPs, RNs, and LVNs were involved in the direct Care of the patients with T2DM and ensured that lifestyle modification protocols were followed. Patients and families are other groups of key stakeholders

that were indirectly involved in implementing health coaching, as their participation determined the success of the intervention. The other crucial external stakeholder was the project mentor, who guided the DNP student from the start of the project to its completion. The DNP student has received approval from the clinic to conduct the project (see Appendix C). This project does not require IRB approval.

Intervention

This project's intervention was the Health Coaching education plan to improve glycemic control among patients with type 2 diabetes. The project was guided by the Plan-Do-Study-Act (PDSA) cycle (See Appendix A). Several steps were taken to implement the health coaching intervention among healthcare providers'/staff members at the project site. Approval was obtained from the practice setting before the implementation. Clinic staff/providers were invited to attend a lunch-and-learn session to provide some background to the health coaching intervention, discuss the possible impact on the practice, and answer any questions from team members related to the project. Weekly education sessions for lifestyle modification coaching were based on the 6th ADA Diabetes Standards of Care 2023 (ADA, 2022). A list of providers, NPs, RNs, and LVNs was obtained from the primary care setting. The DNP student contacted each participant individually to request volunteer participation in the project (Flaubert et al., 2021). The participants were allowed to opt out of the project at any time. Once the participants agreed to participate, they were given full disclosure of the project details, and goals were reviewed. During the first interaction, educational flyers were distributed to the participants. Most importantly, the LVNs, NPNs, and RNs used the Blood Glucose Log to record daily fasting blood glucose levels from week one through week four.

Planning Project Team. The project team included primary care providers such as RNs, NPs, LVNs, project leaders, project mentors, nurse managers, and other administrative staff. The project lead was responsible for planning activities and conducting in-service education. The RNs, NPs, and LVNs were coached on implementing lifestyle modification protocol based on the

6th ADA's standard of Care (see Appendix F) (ADA, 2022). They were directly involved in caring for patients and recording fasting blood glucose levels for patients using the Blood Glucose Log.

Resources and Timeline. The resources required in this project included direct labor, direct materials, stationery, office space, and travel expenses. The only actual cost specified was printing and purchasing folders, binders, and plastic paper inserts to protect the materials given or used for health coaching. Other resources include human resources such as NPs, RNs, and LVNs, the key participants drawn from the clinic. The project timeline started on Nov 6th, 2022, lasting four weeks (one month- running from November to Dec 1st, 2023); health coaching education on lifestyle modifications with PowerPoint presentation was provided during the first week on a single day (Reid & DeGennaro, 2022).

Tools

This project employed the health coaching education intervention based on the ADA Diabetes Standards of Care (ADA, 2022). The tools used include the PDSA framework (see Appendix A), the IRB determination form for TUN was not needed (see Appendix B), Permission to complete the project at the site was granted (see Appendix C), provider glucose monitoring log (see appendix D), Blood Glucose Log (See Appendix E), Health Coaching Diabetes Education Plan (see Appendix F), Educational Flyer (See Appendix G), and Project Timeline (See Appendix H). Institutional Review Board (IRB) materials from the project site are not required because this is a quality improvement project. The ADA developed and validated the glucose monitoring log (see Appendix D) (ADA, 2022). The tools are freely available in the public domain, and no permission is required.

Tool Example

The Health Coaching Education Plan

The Health Coaching intervention protocol incorporates an education plan (Appendix F) that adheres to the ADA Diabetes Standards of Care (ADA, 2022). The Health Coaching

education plan has six education areas with various teaching strategies. The contents of the education plan include personal motivation for lifestyle change, individual progress and learnings, blood glucose and HgA1c and targets, course of type 2 diabetes, most recommendations for nutritious foods, and the benefits of a low-fat plant-based diet for people with diabetes (ADA, 2022). The project lead developed this teaching plan using EBP per ADA Standards of Care. The Health Coaching handouts were provided to providers by the front desk clerk during the intervention period. The nurse manager discussed the information within the flyers during the implementation period.

Blood Glucose Log

The American Diabetes Association developed the blood glucose monitoring log (see Appendix E) to help record and monitor daily fasting blood glucose levels (ADA, 2022). It is a more comprehensive log incorporating the blood sugar levels at various times on different days. In the health coaching education plan, providers used this log to determine how their patients' blood sugar responds to other foods, activities, and medications.

Educational Flyer

An educational flyer was developed based on best practices, with a review from the site mentor and providers. (See Appendix G). The flyers were distributed to the participants in the training room at the first educational session. The educational flyer provided health coaching information to help the providers teach T2M patients and their families about diabetes self-care and management. The education also empowered clinical staff with tools for implementing diabetic self-care knowledge they can apply in their daily clinical practice, thereby improving outcomes for diabetes health coaching intervention.

Glucose Monitoring Tool

The providers monitored patients' glucose levels during the implementation phase using the Glucose monitoring tool (Appendix D). Blood glucose monitoring helped to identify patterns in the fluctuation of blood glucose levels that occur in response to diet, exercise, medications, and

pathological processes associated with the impact of lifestyle modifications by patients (Reid & DeGennaro, 2022). This tool also identified participant demographics as age, gender, ethnicity, and average fasting daily blood glucose levels. The providers used finger-prick testing, especially when fasting and at two-hour post-meal times, and recorded the results on the glucose monitoring tool.

Plan for Data Collection

All participating primary care providers, NPs, RNs, and LVNs who had agreed to participate were notified of their participation regarding health coaching on lifestyle modifications through emails. Education sessions were conducted in person during week one. Reminders were sent one week before the start of the project. Any identifier details of the participants were kept confidential and anonymous to protect the respondents' identities (LoBiondo-Wood & Haber, 2021). The recorded daily fasting blood glucose was collected from patients weekly by the providers for four weeks, beginning from week one.

Flyers were printed and distributed to the participants during the educational session. The providers monitored glucose levels using the average fasting blood glucose. Providers observed and reminded to teach and encourage patients on active lifestyle modifications weekly (LoBiondo-Wood & Haber, 2021). The project lead called the providers twice weekly to check their progress, questions, or concerns. Charts were reviewed a week before the implementation phase. Ten blood glucose charts were reviewed and audited after educational sessions. The review was from week one through week four.

The data collected from the chart audits were stored in a password-protected Excel file. An alpha-numeric code was used instead of provider names, using initials and date of birth to avoid direct identification (Theodos & Sittig, 2021). The data collected was recorded on an Excel spreadsheet and stored in a password-protected computer. The same computer was used to store project results. Only the project lead and nurse manager had access to the computer (Theodos & Sittig, 2021).

Plan for Analysis

A *paired t-test-square* test was used to measure if the change in glucose levels for the four weeks was significant (LoBiondo-Wood & Haber, 2021). The level of significance was set at p=0.05. The results were statistically significant if the p-value was less than 0.05 (LoBiondo-Wood & Haber, 2021). The Statistical Package for the Social Sciences (SPSS) was used to run a *t*-test to measure changes in blood glucose levels before and after the intervention (Pallant, 2020). There are no plans to seek the services of a statistician because the project lead is knowledgeable in data analysis using SPSS.

Ethics/Human Subjects Protection

There is no risk to the providers. There was no active recruitment of participants in this project. The providers who agreed to participate were recruited via email invitation. The providers, divided into three groups were allocated four patients in each group. In this project, the providers experienced improved knowledge of diabetes management, while the patients experienced improved blood sugar control (Theodos & Sittig, 2021). There was no monetary compensation for participation in this project. To maintain compliance with Touro University of Nevada's policy, the Institutional Review Board (IRB) determination form was submitted for review. It was determined by the project team to be a quality improvement project. Since the project utilizes a QI design based on published best practices and did not involve direct patient care or human subjects, it was determined that it did not require IRB oversight.

Analysis of Results

This project used a sample size of 10 patients, with males at 40% and females at 60%. The mean for pre-implementation average blood sugar was 277.43, while that for post-implementation was 182.72 (See Table 1). In the project, 50% of the participants were Hispanic, 30% were African-American, and 20% were Caucasian. The t-value from paired sample tests was 126.51, while the p-value is <0.001, which is statistically significant. These results are statistically significant, as indicated by a substantial decrease in average blood glucose levels, particularly in

the third and fourth weeks. The mean difference of 94.70952 suggests a substantial reduction in blood glucose levels from pre-intervention to post-intervention. The high t-value and very low p-values <.001 indicate that the difference is statistically significant; thus, the intervention should be sustained at the clinic (See Table 2).

Table 1

Pre- and Post-implementation Average Glucose

Descriptive Statistics

	N	Minimum	Maximum	Sum	Mean	Std. Deviation
Pre-intervention average daily blood glucose	10	274.21	280.00	2774.29	277.4286	2.06224
PostInterventionAverageBloodGlucose	10	180.07	185.48	1827.19	182.7190	1.82622
Valid N (listwise)	10					

Table2

Blood Glucose Paired T-test

Paired Samples Test

		Paired Differences					t	df	Significance	
					95% Confidence Interval of the Difference					
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper			One-Sided p	Two-Sided p
Pair 1	Pre-intervention average daily blood glucose - AverageGlucose- Post Intervention Blood Glucose	94.70952	2.36731	.74861	93.01605	96.40300	126.514	9	<.001	<.001

Figure 1

Pre- Intervention Average Blood Glucose

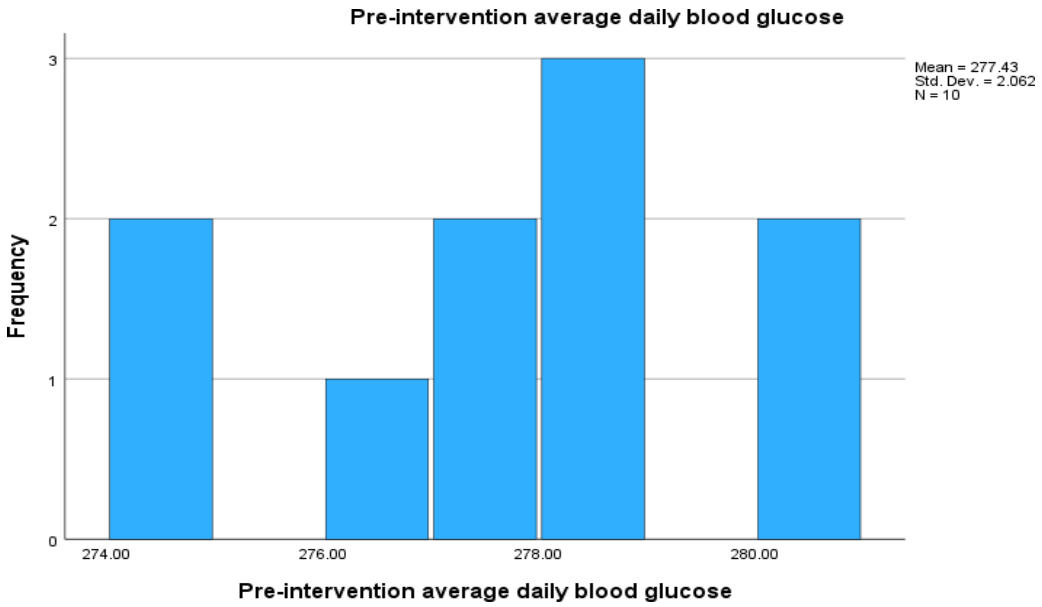
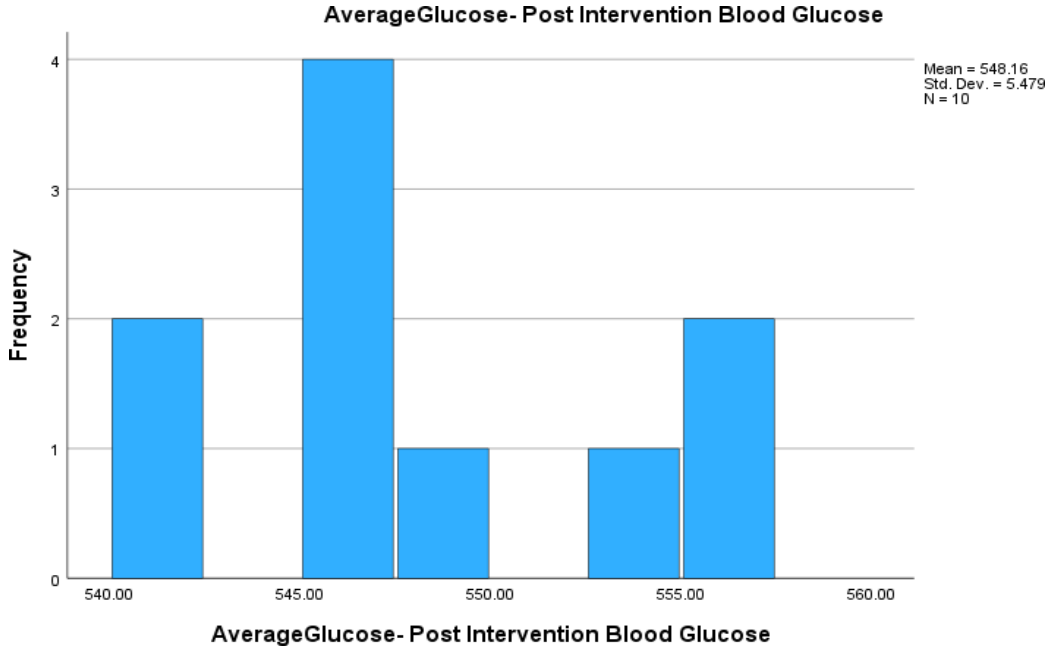


Figure 2

Post-Intervention Average Blood Glucose



Statistical Assumptions

The first assumption adhered to was the random sampling methodology. The assumption is that participants were selected randomly or that the sample is representative of the larger

population. Random sampling is often an underlying assumption in statistical analyses. The second assumption is the normal distribution. Many statistical tests, such as t-tests and chi-square tests, assume the data follows a normal distribution. This assumption is crucial for the project for the accuracy of these tests. There was a slight modification in the timeline, especially during data collection. The pre-implementation data was collected in week 1, and the post-implementation data collection began in week 2 through week 4. Week 1 data acted as the baseline data used for comparison.

Summary and Interpretation of Results

The implementation of health coaching resulted in a decrease in average blood glucose levels, particularly evident in the third and fourth weeks. Based on the statistical analysis, strong evidence suggests that health coaching significantly and positively affected average daily blood glucose levels. The mean difference is substantial, and the results are statistically significant. There was an improvement in the blood glucose control represented by 34.1384% (See Table 1). This value is within the anticipated threshold of 22.03% to 37%, implying that the intervention was successful and can be sustained at the clinic.

This project had various strengths and limitations. For instance, the objectives were straightforward, and the methodology followed an evidence-based approach. The findings of this project helped educate people on how to lower blood glucose levels and help them control their glycemic levels to avoid diabetes-related complications such as cardiovascular disease and stroke. The sample size was ten patients, and the project duration was four weeks. This period did not allow sufficient time to investigate the reason or reasons for a behavioral change. Extending the results to more extensive and diverse groups becomes challenging when smaller samples are used because the population may be affected by other factors that the smaller sample might not have captured. Moreover, considering the different eating patterns of various races and cultures, the project’s dietary counseling methods may not directly apply to all cultural groups in

California; this is why we suggest that related studies describe the changes in eating behaviors more specifically.

The results align with the literature, which revealed that health coaching intervention significantly improved T2DM patients' glycemic control levels and healthy diet behavior (Davies et al., 2022). As noted from the results, through health coaching, patients' knowledge about lifestyle modifications may improve glycemic control and reduce diabetes-related complications in the practice setting, as supported by Lin et al. (2021). The literature indicated that limited diabetic knowledge also leads to poor glucose control and increased morbidity and motility (Pinkhasova et al., 2021). Like the current project, most reviewed studies were conducted to improve overall glycemic control and self-care management skills through educational classes and provider coaching as the best evidence-based practice (EBP) (Sullivan et al., 2019).

This project may impact the lives of individuals in the community beyond glucose control to improve cardio-metabolic and mental health outcomes. Evidence indicates that individuals exposed to health coaching experience reduced depression/distress at post-treatment. This project has shown the potential to enhance self-efficacy, health-related quality of life (QoL), medicine and treatment adherence, behavioral changes such as dietary changes, and reduced healthcare utilization and cost. According to the ADA (2022), the economic cost of diabetes in the United States is approximately $327 billion, with expenditures 2.3 times higher in patients diagnosed with diabetes than in those without it. This intervention can reduce the healthcare cost related to diabetes by lowering the cost per individual readmission as a result of type 2 diabetes rather than treatment and management. However, there are trade-offs between diabetes testing and treatment and diabetes prevention through health coaching, making those trade-offs for health coaching elements such as choosing a balanced diet and engaging in physical activities instead, which drives those competing demands to be a little bit worse and

might further lead to financial difficulties among the already vulnerable individuals in the society.

Limitation

This DNP scholarly project had various limitations ranging from bias to those relating to data analysis. For instance, the project utilized the inclusion-exclusion method in the selection process. The targeted population was primary care clinic nurses caring for type 2 diabetes (T2DM) patients and included nurse practitioners, registered nurses (RN), and licensed vocational nurses (LVNs). The project also excluded healthcare practitioners who were not permanent and other auxiliary staff, such as therapists. These biases limit the possible conclusion and negate the statistical outcome of the project (George et al., 2019).

Moreover, the project did not involve the family members of the T2DM patients. The family members are also directly involved in the care of these patients and the health coaching. The project advocated for the training of the caregivers while the patients were engaged as secondary participants. This approach should have encountered the patients and some primary participants to gain a full view of the direct impact of health coaching.

Further, the data collection approach used was subjective because the accuracy and consistency of the fasting blood glucose could have led to potential bias or an overlook of subtle statistical intricacies that professional statisticians could have identified.

Efforts Made to Minimize and Adjust for Limitations

While excluding non-permanent healthcare practitioners may limit the generalizability of the conclusion, it was a deliberate choice to focus on a specific group for the intervention. The intervention aimed to directly impact the individuals most involved in the day-to-day care of T2DM patients. The project design was also deliberate to ensure that only the primary caregivers were involved for maximum impact. However, the family and auxiliary staff members were engaged as an indirect population. Therefore, their contribution was incorporated into the project to measure their role in the care of patients with T2DM.

Further, training the nurse practitioners, registered nurses (RN), and licensed vocational nurses (LVNs) had a broader impact on practice; this is because the health coaching process is iterative, and this group has a broader reach than individual patients and family members. The data collection tools were standardized to ensure that all data captured were accurate and uniform. Data normalization was also done in addition to incorporating assumptions in the statistical analysis to handle the data discrepancies. The project lead was well-trained in data analysis and statistical methods. The lead also had vast experience in clinical research and could handle complex data analysis.

Conclusion

The project's main objective was to determine the efficacy of health coaching by primary care providers caring for type 2 diabetes mellitus (T2DM) patients to improve glycemic control. The aim was to implement a health coaching protocol in line with ADA diabetes education recommendations for healthcare providers caring for T2DM patients to enhance patient glycemic control and prevent the development of diabetes complications. The project used the Plan-Do-Study-Act (PDSA) cycle as the implementation framework. The PDSA model was used to evaluate the change process in diabetes care using lifestyle modification strategies. The primary participants in the project were healthcare providers, including RNs, NPs, and LVNs who care for patients with T2DM in a primary care setting. The indirect population was patients with T2DM who were receiving education on lifestyle modification strategies. These patients indirectly participated in the project by receiving education and potentially benefiting from the health coaching intervention to improve glycemic control. A *chi-square* test was used to measure if the change in glucose levels over the four weeks was significant, and a *t*-test was used to measure changes in blood glucose levels before and after the intervention. The Statistical Package for the Social Sciences (SPSS) was used for data analysis. The project findings indicated that health coaching intervention significantly decreased the average daily blood glucose levels in patients with T2DM. The project investigators also noted that the results aligned with the literature, which

revealed that health coaching interventions significantly improved T2DM patients' glycemic control levels and healthy diet behavior. The project findings also suggested that patients' knowledge about lifestyle modifications through health coaching may improve glycemic control and reduce diabetes-related complications.

Implication for Practice in the Nursing Field

The project findings showed that the intervention can potentially improve patient outcomes by contributing to better glycemic control, which is essential for preventing diabetes-related complications. The project contributes to the body of knowledge on evidence-based practices for diabetes care and highlights the importance of lifestyle modifications and patient education in improving glycemic control. The project's findings support implementing health coaching protocols in primary care settings to enhance patient glycemic control, which impacts quality improvement initiatives in healthcare. By improving glycemic control and reducing the risk of diabetes-related complications, the health coaching intervention can potentially lead to cost savings in healthcare. The project underscores the importance of patient education and self-management support in diabetes care.

Sustainability

The health coaching intervention was implemented within the primary care setting, integrating it into the routine care provided to patients with T2DM. Embedding the intervention into the clinical workflow becomes a standard part of care delivery, enhancing sustainability. The project utilized the Plan-Do-Study-Act (PDSA) cycle to evaluate the change process in diabetes care. This approach allows for continuous assessment of the intervention's effectiveness and identifying areas for improvement, contributing to its sustainability. By involving stakeholders, such as healthcare providers, in implementing and evaluating the intervention, there is sustained support and commitment to the project's success.

The project empowers nurses to engage in collaborative goal-setting with patients, provide education, and support self-management. It underscores the need for nurses to be

equipped with the knowledge and skills to help patients in self-care management. The intervention emphasizes the role of nurses in coordinating care for patients with T2DM, including providing support for lifestyle modifications, monitoring glycemic control, and facilitating patient education. Moreover, the project provides the foundation for developing policies that support the implementation of health coaching interventions in clinical settings. It could lead to policy changes that support the role of health coaching in improving patient outcomes. This could lead to reimbursement for health coaching services. The project may influence the development of policies prioritizing patient education, lifestyle modifications, and self-management support as essential components of diabetes care.

Further, this DNP project will be disseminated to various institutions on various days. For instance, it will be disseminated to Touro University Research day. It will be disseminated to DNP Repository website, and also in the National association of Nigerian Nurse Practitioners USA Educational Conference in October 3rd to 5th 2024. More importantly, it will be sent to via emails to key stakeholders at St. Johnson Community Health center in Los Angeles, California.

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Appendix A

PDSA MODEL

Appendix B

Affiliation Agreement Statement

Affiliation Agreement Statement:

Touro University Nevada does not require affiliation agreements for DNP Practicum Experiences. However, the project/practicum site may require an affiliation agreement with Touro. Please delegate this form to an appropriate project/practice site representative for completion.
Please fill in the blanks below and check the appropriate box:

The TUN DNP student: Vivienne A. Onyeneke is authorized to complete practicum hours at the above listed project site.

_____ An affiliation agreement is required for completion of this practicum experience.

__✓__ An affiliation agreement is not required for completion of this practicum experience.

*If an affiliation agreement is required, please insert the name and contact information of the person who will coordinate the agreement:

Name of representative: Bukola Olusanya

Contact Information and preferred contact method: bolusanya@wellchild.org.

Authorized Project Site Representative Signature: _____

Student Signature: _____

Appendix C

Site Affiliation Agreement Letter

- Meet in person or virtually, with the Project Team at least as needed throughout the students' academic career at TUN.
- Make consistent progress towards completion of the DNP Scholarly project/practicum and to keep the PM and Project Team updated on their progress through submission of appropriate weekly Practicum logs and communication with all parties on an as needed basis.
- Complete all project/practicum course assignments in a timely manner.
- Reach out to the PM with questions and for support as needed.

Responsibilities of the Project/Practicum Instructor

The Project/Practicum Instructor agrees to:

- Always maintain open communication with the PM and Student.
- Schedule virtual meetings with the PM and Student at least once per session and as needed at other times.
- Review the weekly progress reports made by the student and identify and communicate issues that the committee must address.
- Support the student and the PM through availability and responsiveness to identified issues.
-

The overall DNP Project/Practicum experience is monitored and approved by the Project/Practicum Mentor and DNP Project/Practicum Instructor to meet the rigor and clinical requirements of said experience.

I agree to abide by the respective responsibilities stated above, both implicit and inferred.

Signature of PM — Date: 3/24/23

Bukola Olusanya, DNP, FNP-C — Date: 3/24/23
Printed Name of PM

St. John's Community Health
Project/practicum Site Name

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Project/practicum Site Phone Number

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Project/practicum Site Contact Person & Email Address

Signature of Student — Date: 03/24/23

Vivienne A. Onyeneke
Printed Name of Student

Efficacy of health Coaching to improve glycemic control through life style modification among diabetic patients in primary care
Title of DNP Scholarly Project/practicum

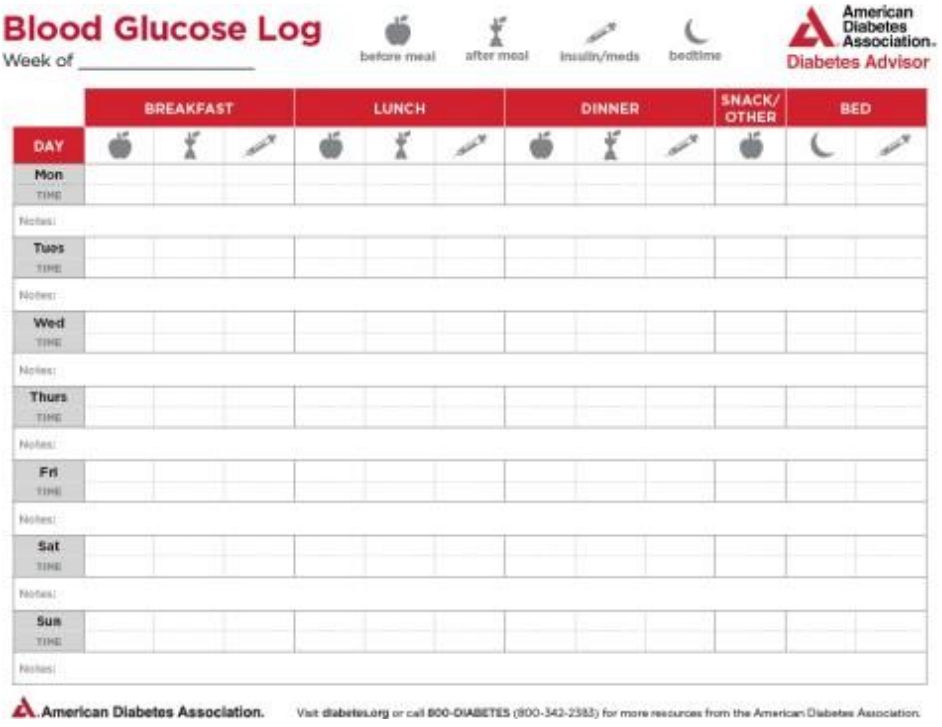
Appendix D

Provider's Average Glucose Monitor

Patient	Pre-average	Week One Av	Week Two Av	Week Three Av	Week Four Av	Week Five Av
A						
B						
C						
D						
E						
F						
G						
H						
I						
J						

Appendix E

Blood Glucose Log



Blood Glucose Log

Week of _____

before meal | after meal | insulin/meds | bedtime

American Diabetes Association. Diabetes Advisor

DAY	BREAKFAST			LUNCH			DINNER			SNACK/ OTHER	BED	
Mon TIME												
Notes:												
Tues TIME												
Notes:												
Wed TIME												
Notes:												
Thurs TIME												
Notes:												
Fri TIME												
Notes:												
Sat TIME												
Notes:												
Sun TIME												
Notes:												

American Diabetes Association. Visit diabetes.org or call 800-DIABETES (800-342-2383) for more resources from the American Diabetes Association.

Appendix F

Health Coaching Diabetes Education Plan

Session	Learning Objectives (*Participants…)*	Content Outline	Teaching Strategies	Food Samples	Handouts
1	· Explore personal motivation for lifestyle change and better diabetes self-management. · Define diabetes. · Identify common myths and facts about diabetes. · Describe their feelings about living with diabetes. · List causes of hyper- and hypoglycemia. · Identify personal barriers and supports for diabetes self-management. · Explain the CREATION Health acronym. · Discuss lifestyle strategies for achieving better diabetes self-management. · Create a personal wellness vision to defeat diabetes. · Discuss the importance of having a plan for diabetes self-management. · Set one-week SMART steps to defeat diabetes and move toward their vision.	· Intro to Coaching Model · Defining the *Why*? · *Diabetes Conversation Map:* On the Road to Better Managing Your Diabetes (Diabetes Overview; Diabetes Myths & Facts; Feelings About Diabetes; Signs of High & Low Blood Sugar) · Review Diabetes Lending Library · Intro to CREATION Health · Creating a Personal Wellness Vision Around Diabetes	· Group Discussion · PowerPoint Presentation · Group Coaching · Handouts · Weekly SMART Steps · Takeaways	· Crockpot Breakfast · Breakfast Beans · Ezekiel 4:9 Bread · Baked Apple Oatmeal	· Pt. Ed. Flyer · CREATION Health Recap · Session #1 Recipes · My Blood Sugar Log · My Steps Log · My Vision · My Decision Balance · SMART Steps
2	· Discuss personal progress and learnings. · Describe their feelings about food and how it influences their behavior. · Define the major nutrients and their effect on blood glucose levels. · List 5 strategies for eating smaller portions.	· *Diabetes Conversation Map:* Diabetes and Healthy Eating (Feelings About Food; Meal Planning: Quantity and	· Progress & Learnings · Group Discussion · PowerPoint Presentation · Group Coaching · Success Stories	· Cranberry & Mango Quinoa Salad · Mexican Quinoa Vegetable Soup · Vegetable Chili	· PPT Handout · CREATION Health Recap · Session #2 Recipes · My Blood Sugar Log

	· Describe the impact of the timing of meals on blood glucose. · Identify a situation they find challenging when making food choices and one or more strategies for dealing with it. · Discuss lifestyle strategies for achieving better diabetes self-management. · Set one-week SMART steps to defeat diabetes and move toward their vision.	Timing of Food; Challenges Faced) · Success Story · CREATION Health, part 2 · Goal-Setting	· Weekly SMART Steps · Takeaways	· Black Bean Brownies	· My Steps Log · SMART Steps
3	· Define blood glucose and HgA1c and targets for each. · State one reason why monitoring blood glucose is important to them personally for managing their diabetes. · Identify their feelings related to monitoring blood glucose. · List three s/s of low and high blood glucose and how to treat them. · Identify the effect of food, exercise, stress, and meds on blood glucose levels. · Discuss lifestyle strategies for achieving better diabetes self-management. · Set one-week SMART steps to defeat diabetes and move toward their vision.	· *Diabetes Conversation Map:* Monitoring Your Blood Sugar (Blood Glucose Targets: Recognition and Treatment of Highs and Lows: Changes in Your Routine; Knowing Your A1c) · Success Story · Understanding Insulin Resistance* · CREATION Health, part 3	· Progress & Learnings · Group Discussion · PowerPoint Presentation · Group Coaching · Success Stories · Weekly SMART Steps · Takeaways	· Black Bean Avocado Salad · Lentil Vegetable Soup · Hummus · Green Smoothies	· PPT Handout · CREATION Health Recap · Session #3 Recipes · My Blood Sugar Log · My Steps Log · SMART Steps
4	· Describe the natural course of type 2 diabetes. · Name the diabetes med(s) they take and how they work. · Define the ABCs of diabetes: A1c, BP, and Cholesterol. · Discuss how to use food labels to choose healthier foods. · Discuss lifestyle strategies for achieving better diabetes self-management.	· *Diabetes Conversation Map:* Continuing Your Journey with Diabetes (Short-term and long-term complications of diabetes; Diabetes medications;	· Progress & Learnings · Group Discussion · PowerPoint Presentation · Group Coaching · Success Stories	· Acorn Squash Supreme · Mashed Cauliflower · Chicken-style Gravy · Kale Apple Salad · Pumpkin Mousse	· PPT Handout · CREATION Health Recap · Session #4 Recipes · My Blood Sugar Log · My Steps Log

	· Set two-week SMART steps to defeat diabetes and move toward their vision.	Knowing your ABCs) · Success Story · CREATION Health, part 4 · Understanding Food Labels	· Weekly SMART Steps · Takeaways	· Whipped Coconut Cream	· SMART Steps
5	· Discuss how to choose the most nutritious foods in their local grocery store. · List three new foods they are willing to try. · Discuss lifestyle strategies for achieving better diabetes self-management. · Identify three strategies for choosing healthy foods during holidays and when eating out. · Explain how to turn a "failure" into a stepping stone toward success. · Set two-week SMART steps to defeat diabetes and move toward their vision.	· *Taking Control of Diabetes* grocery store tour · Eating out healthfully. · Success Story · CREATION Health, part 5 · ABCs of Behavior Change · Anticipating Obstacles · Redefining Failure	· Progress & Learnings · Video · PowerPoint Presentation · Group Coaching · Success Stories · Label Reading Quiz & Activity · Weekly SMART Steps · Takeaways	· Commercial Non-Dairy Milks · Commercial Whole Food Plant-Based Convenience Items (Morningstar Farms vegetarian burgers, Amy's burritos, etc.)	· PPT Handout · CREATION Health Recap · My Blood Sugar Log · My Steps Log · ABCs of Behavior Change · Anticipating Obstacles · Setbacks to Comebacks · SMART Steps
6	· Discuss the benefits of a low-fat plant-based diet for diabetics. · List three strategies for taking control of diabetes. · Define two 3-month SMART goals for defeating diabetes. · Set two-week SMART steps to defeat diabetes and move toward their vision.	· *Taking Control of Diabetes* lecture · Understanding Metformin* · Why Blood Sugar Rises During the Night* · Your Success Story · CREATION Health, part 6 · Diet and Diabetes	· Progress & Learnings · Video · PowerPoint Presentation · Group Coaching · Success Stories · Weekly SMART Steps · Takeaways	• None	· PPT Handout · CREATION Health Recap · My Video Notes · My Blood Sugar Log · My Steps Log · SMART Steps · *Defeating Diabetes* 3-Month Goals

*Topics added per participant request.

Appendix G

Patient Education Flyer

DIABETES

What is Diabetes?

Understanding more about *why* and *how* can help you really succeed with your treatment.

If you or someone you know has diabetes, you're not alone. Millions of people have diabetes. Diabetes cannot yet be cured. But it can be managed.

The most common types of diabetes are type 1 and type 2

Type 1

In **type 1 diabetes**, the body makes little or no insulin, due to an immune system response that destroys insulin-producing cells. So people with type 1 diabetes must take insulin every day. Type 1 diabetes usually occurs in children and young adults, but it can also appear in older adults.

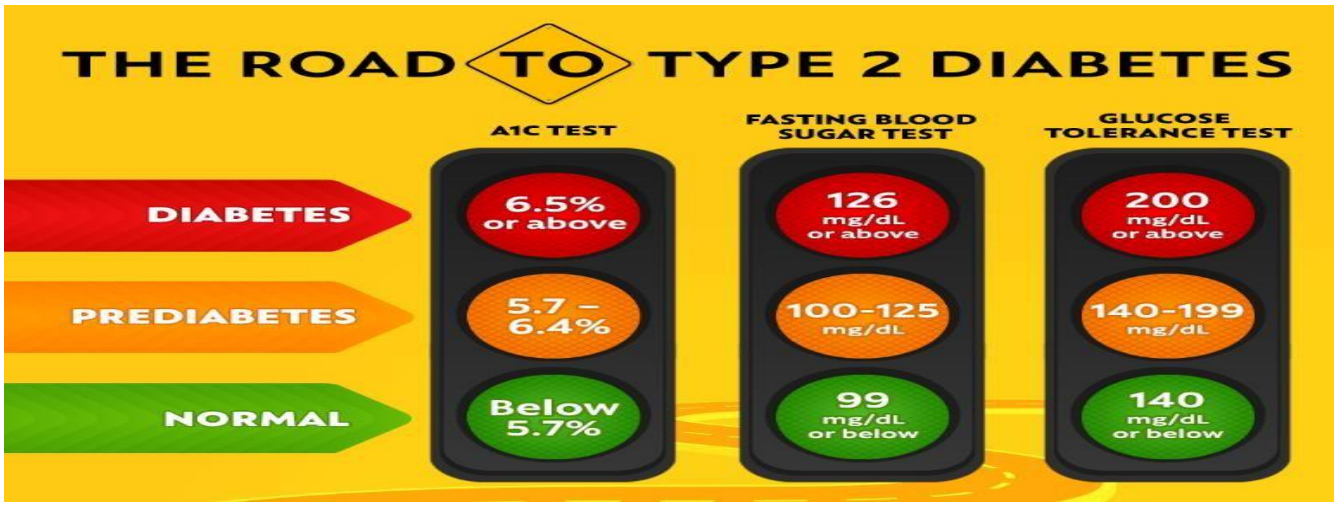
Type 2

In **type 2 diabetes**, your body does not respond to and use insulin as well as it should. Or it may not make enough insulin. Most people with diabetes have type 2. Some risk factors for this kind of diabetes include older age, being overweight or obese, family history, and having certain ethnic backgrounds.

Understanding diabetes

Diabetes is a condition in which the body doesn't make or use insulin correctly.

- When you eat, some of your food is broken down into glucose (a type of sugar). Glucose travels in your blood to all your body's cells. Your cells need glucose for energy
- The pancreas, an organ near your stomach, contains beta cells that release a hormone called insulin
- Insulin helps move the glucose from your blood into your cells. Insulin is like a key that unlocks the doors of your cells so that glucose can get in and be used as a source of energy. Without insulin, extra glucose can't get into the cells and it stays in the blood



UNDERSTAND BLOOD GLUCOSE

The first step to managing your blood sugar is to understand what makes blood sugar levels rise

GLUCOSE
INSULIN

The carbohydrates and sugars in what you eat and drink turns into glucose (sugar) in the stomach and digestive system. Glucose can then enter the bloodstream.

Insulin is a hormone made in the pancreas that helps the body's cells take up glucose from blood and lower blood sugar levels.

In Type 2 diabetes, glucose builds up in the blood instead of going into cells because:

The body develops "insulin resistance" and can't use the insulin it makes efficiently.

The pancreas gradually loses its ability to produce insulin.

The result can be a high blood glucose level.

TRACK LEVELS

Health care professionals can take blood glucose readings and provide recommendations. If you're diagnosed with Type 2 diabetes, you will need to monitor your blood sugar level regularly.

Visit KnowDiabetesbyHeart.org to learn how to manage your risk for heart disease and stroke if you have diabetes.

Fasting Blood Glucose	Diagnosis	What It Means
Lower than 100 mg/dl	Normal	Healthy range
100 to 125 mg/dl	Prediabetes (impaired fasting glucose)	At increased risk of developing diabetes.
126 mg/dl or higher	Diabetes Mellitus (Type 2 diabetes)	At increased risk of heart disease or stroke.

[redacted]

TIPS FOR SUCCESS

EAT SMART

Eat a healthy diet of vegetables, fruits, whole grains, beans, legumes, nuts, plant-based proteins, lean animal proteins like fish and seafood.

Limit sugary foods and drinks, red or processed meats, salty foods, refined carbohydrates and highly processed foods.

MOVE MORE

Being physically active can lower your risk of developing diabetes and help you manage the disease if you already have it.

MANAGE WEIGHT

Stay at a healthy weight to help prevent, delay or manage diabetes

NO NICOTINE

Smoking, vaping, exposure to secondhand smoke or using tobacco can increase your risk of heart disease, stroke, many cancers and other chronic diseases. It may also make prediabetes and diabetes harder to manage.


7 STEPS FOR BETTER LIVING WITH DIABETES
1 EAT HEALTHY
Eat lots of vegetables and fruit
Reduce or eliminate sugary foods and drinks
Watch or reduce carbs
Watch portion sizes
Eat regular meals
Lose 10–20 pounds if you are overweight
2 BE ACTIVE
Exercise 5 days a week
Be active 30 minutes a day
3 MONITOR
Check your blood sugar levels; know your A1C
Check your blood pressure, cholesterol, eyes, feet and teeth
4 TAKE MEDICATION
Know your pills and insulins, understand how they work and take the right doses at the right times
5 PROBLEM SOLVE
Recognize your high and low blood sugars, understand what caused them and learn to treat and prevent them
6 REDUCE RISK
Quit smoking
Do regular health exams (eye, foot & dental)
See your doctor regularly for check-ups and tests
7 COPE WELL
Get support from your family, friends and diabetes care team
Set realistic goals and work toward them
National Jewish Health
Breathing Science is Life.
njhealth.org
1.800.222 LUNG
(800.222.5864)

Appendix H

Project Timeline

Weekly Summary for Project III	
Clearly and succinctly summarize project status. Discussion includes any updates to the project timeline. **DO NOT COMPLETE NOW- SAVE FOR DNP PROJECT III**	
Week 1: Nov 6th, 2023	• Participant Recruitment- all participating primary care providers, NPs, RNs, and LVNs were notified of their participation regarding health coaching on lifestyle modifications. • Educational sessions were conducted- The project lead educated the providers on weekly follow-ups with their patients. • The ADA care standard and health coaching on lifestyle modifications were introduced. Data tracking and collection methods were also introduced to monitor the implementation process. • The providers collected pre-implementation data, which acted as the baseline data for comparison.
Week 2: Nov 10th, 2023	• Project implementation commenced immediately after the educational sessions. • Providers collected baseline blood glucose and gave their patients daily glucose logs and flyers they took home. Weekly telephone appointments were scheduled with patients to discuss their daily blood glucose readings with the providers, and their patients were reminded about active lifestyle modifications such as daily exercise as tolerated, healthy nutrition, and medication compliance. • The Providers. Affirmed that. The patients were willing to participate in the project. Patient were able to give their providers their first-week blood glucose reading when contacted via telehealth visit as scheduled, • Providers admit a few missed days of not checking their blood glucose by a patient. • The project lead called to check in with providers to see how they are progressing on data collection and to collect blood glucose readings for the week. • Providers summarized the weekly average blood glucose for the project lead.
Week 3: Nov 16th, 2023	• The project lead monitored the implementation and data collection processes. • Providers met patients via telehealth appointments to further. • The providers discussed their blood glucose readings for the week.

	• Providers continued to remind, teach, and encourage patients on active lifestyle modifications such as the right exercise, nutrition, and compliance with medication (Health Coaching). • The project lead called in to check with providers to see their progress and if they have any questions or concerns. • The patients visited the clinic at the end of week 3, presented their daily fasting blood glucose, and had their weights taken. • The project lead visited the clinic at the end of week 3 and collected data from the providers.
Week 4: Nov 22nd, 2023	• Providers supplied patients with daily glucose logs and flyers, which they took home to record their daily fasting blood glucose. • The providers also set up weekly telephone appointments to meet with patients to collect their daily blood glucose readings. • The providers also contacted patients via telephone and reminded them of active lifestyle modifications such as the right exercise, nutrition, and compliance with medication. • The project lead called in to check in with providers to see how they were doing with the implementation process and if they had any challenges. • At the end of week 4, the project lead visited the clinic and collected the providers' weekly fasting blood glucose records. • Everything went well on week 4 without any challenges or constraints.
Week 5: Dec 1st, 2023	• At the beginning of week 5, the project lead visited the clinic and collected all the implementation data for the four weeks from the providers. The project lead also collected the pre-implementation data in week 1 to act as a baseline for comparing whether the intervention effectively controlled blood sugar levels. • The data collected included the weekly average of the daily fasting blood glucose and post-prandial blood glucose. • The project lead prepared the collected data for analysis by recording them on an Excel spreadsheet, removing all identifiers, and ensuring that participants' privacy was protected. • The project then transferred the data into SPSS version 29 for in-depth analysis. The project lead set the level of significance at $p=0.05$. • The project lead conducted a paired t-test to determine the effectiveness of health coaching in improving blood sugar levels. The results were statistically significant, as demonstrated by the $p<0.05$.