

A DIABETES EDUCATIONAL INTERVENTION TO IMPROVE
SELF-MANAGEMENT
(A QUALITY IMPROVEMENT PROJECT)

by

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As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Brooke Elizabeth Harper, titled A Diabetes Educational Intervention to Improve Self-Management and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

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Final approval and acceptance of this DNP project is contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.

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DEDICATION

To all the patients struggling with diabetes, I hope this project will contribute to your health and well-being. Thank you to those patients who participated. I hope you will use the knowledge gained through this project to care for yourself more confidently.

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ABSTRACT

Purpose: This DNP quality improvement project aimed to assess the feasibility and usability of educational videos to improve diabetic patients' knowledge of diabetes self-management.

Background: Diabetes prevalence is growing and accounts for 20% of chronic diseases in the US, with 34.2 million people (10.5% of the population) diagnosed in 2018. Severe comorbidities are associated with inadequate management of diabetes, prompting a focus on diabetes self-management education. Diabetes self-management education benefits non-insulin-dependent diabetic patients by lowering hemoglobin A1C (HbA1C) levels up to 0.5%-2%.

Methods: The Health Behavior Model (HBM) helped develop the education and motivate patients to change to benefiting their health. The Model for Improvement (MFI) helped guide the project design, set goals, identify accomplishments, measure improvements, and select the change that resulted in improvement. A pretest/post-test quantitative design was used with an evidence-based diabetes self-management educational intervention. The project measured knowledge changes from baseline on diet, confidence, and intention to change. The posttest measured the participant's understanding and the effectiveness of the intervention.

Results: Six participants completed both the pretest and the posttest. Demographic data demonstrated the average age of the patients was 57.8 years (range 56-65, SD= 1.5), with 17% male and 83% female. 83% (SD=0.37) of participants reported they never received any diabetes education. The Wilcoxon-signed rank test with a p-value of 0.05 for statistical significance was used to measure the change in knowledge and confidence of the following: I feel fearful about my future health, I know what healthy carbohydrates are, Fresh fish are a great way to incorporate protein into my diet, I feel confident I can manage my diabetes through diet, and

Proteins affect my blood sugar minimally. Comparing the change in the questions mentioned above indicated a statistically significant difference with a p-value = 0.00902.

Conclusions: Advance practice registered nurses (APRNs) can facilitate patient education to support preventative medicine rather than reactive medicine. Results from this project indicate that this educational intervention can increase knowledge and self-efficacy for diabetes self-management. This project can be utilized to benefit the health and well-being of patients, increase best practices, and help promote patient autonomy and self-efficacy.

INTRODUCTION

Diabetes mellitus (DM) in the United States (US) has reached epidemic proportions, with as many as 34.2 million people (10.5% of the population) diagnosed in 2018 (Centers for Disease Control and Prevention [CDC], 2020). Severe comorbidities are associated with inadequate management of this disease, prompting clinicians to focus on diabetes self-management education (DSME). Specifically, high protein, low carbohydrate diets (LCD) benefit non-insulin-dependent diabetic patients by lowering hemoglobin A1C (HbA1C) levels up to 0.5%-2% (Sandouk & Lansang, 2017). Promoting behavior change to improve health outcomes is partially achieved by DSME focused on medical nutritional therapy (MNT; American Diabetes Association [ADA], 2019). In 2017, diabetes was the seventh leading cause of death in the US (CDC, 2020). Over 83,000 deaths a year are attributed to diabetes, and other 270,702-death records list diabetes as a contributing cause of death (CDC, 2020). Additionally, 7.3 million (2.8%) adults are estimated to have undiagnosed diabetes (CDC, 2020).

The damage of diabetes extends beyond personal well-being. The CDC estimates the total associated costs of diagnosed diabetes as \$327 billion, up from \$188 billion in 2012 (CDC, 2020). DSME focusing on nutrition as an evidence-based intervention reduces mortality, secondary comorbidities, and associated costs for patients and providers (Sandouk & Lansang, 2017). Adjusting dietary habits to focus on low carbohydrates and increased protein intake improves glucose control and insulin secretion and sensitivity (Comerford & Pasin, 2016). One of the most challenging DSME topics is meal planning and nutrition, focusing on protein's importance as the primary caloric intake source (Campbell & Rains, 2015). Quality improvement (QI) projects like improving diabetic patients' knowledge of the importance of protein intake for

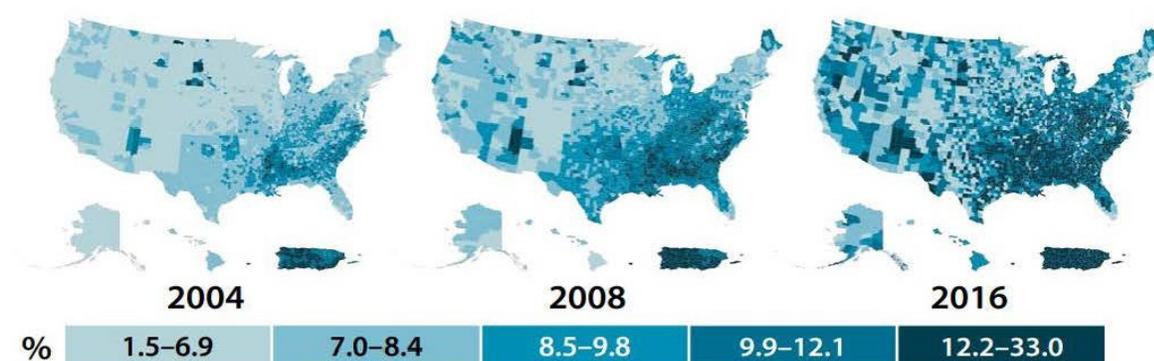
better self-management of HbA1C help ensure patients receive the care and services needed to maximize life expectancy and quality of life while minimizing complications from poorly controlled diabetes. Utilizing an evidence-based intervention like DSME to support the intervention's validity helps patients benefit from their treatment.

Background Knowledge and Significance

Diabetes prevalence is growing steadily and accounts for roughly 20% of chronic diseases in the US, as reflected in Figure 1 (CDC, 2020).

Figure 1

Age-Adjusted, County-Level Prevalence of Diagnosed Diabetes, Adults 20+ Years



Note. The United States, 2004, 2008, and 2016 (CDC, 2020). Data were unavailable for some US territories. Data sources: US Diabetes Surveillance System; Behavioral Risk Factor Surveillance System

Failing to educate patients on uncontrolled diabetes can lead to devastating consequences, including heart disease, stroke, high blood pressure, kidney disease, blindness, dental issues, amputations, and nervous system disorders (Mohammedi et al., 2016). The American Diabetes Association (ADA) *Standards of Medical Care in Diabetes* (2019) recommends using the chronic care model (CCM) to improve the care of diabetic patients, including self-management and decision supported by evidence-based care guidelines (ADA, 2019). However, less than 50% of diagnosed diabetic patients receive dietary education based on current practice guidelines

(Mohammedi et al., 2016). To meet the aims delineated by the Institute of Medicine's (IOM) *Crossing the Quality Chasm*, patients with chronic illnesses like diabetes need DSME and support for self-management (Mohammedi et al., 2016). The ADA recommends healthy eating as a part of a diabetes self-management plan (ADA, 2019). Clinicians can encourage patients by promoting strategies for diet self-management (ADA, 2019). By providing the appropriate education and resources, the patient will better understand diabetes and be confident in managing their health (Rav-Marathe et al., 2016).

Patients need to be involved in a DSME program to foster the knowledge and skills required to manage diabetes, achieve health goals, and modify behavior (ADA, 2019). Effective therapy for the management of diabetes is following an increased protein diet, which results in a decrease in body mass index (BMI) (Sato et al., 2017). Obesity has a significant impact on a person's development of complications related to diabetes and control of diabetes. Over 89% of Americans have a BMI of 25 kg/m² or higher (CDC, 2020). Treating obesity with high protein diets helps delay complications related to diabetes, with weight loss, improving HbA1C levels and, decreasing the need for medications (ADA, 2019). Weight loss as small as 3-5% is associated with clinical improvement in glycemic control and a reduced need for pharmacologic interventions to lower glucose levels (ADA, 2019).

Misconceptions of protein intake for DM patients include perceiving that protein converts to blood glucose and that overeating protein will cause kidney disease (Campbell & Rains, 2015). Although there is an exception for DM patients with impaired renal function, most DM patients need 20-30% of total intake from protein sources (Campbell & Rains, 2015). Protein intake improves glycemic control, leaves patients feeling satiated, preserves and promotes lean

body mass, and helps older populations meet increased protein demands (Campbell & Rains, 2015). Increased protein intake does not increase postprandial glucose levels and stimulates insulin secretion, like a secretagogue, in response to carbohydrate ingestion (Campbell & Rains, 2015).

High protein, low carbohydrate diets are an option to decrease cardiovascular risk factors and increase weight loss. In a Joslin Diabetes Center study, 85 patients attended a 12 week Why WAIT (Weight Achievement & Intensive Treatment) program. This program aimed for participants to consume 20-30% of total food intake as protein; participants lost an average of 11kg, with HgA1C levels dropping from 7.5% to 6.6% (Campbell & Rains, 2015). Protein intake at this percentage had a positive impact on glycemic control, satiety, preservation of lean muscle mass, and aided in weight loss (Campbell & Rains, 2015).

There are numerous educational approaches to improving DM self-management by adopting a high protein and low carbohydrate diet. An educational program emphasizing diet with increased protein intake can improve patients' self-efficacy and attitude towards chronic disease. Additionally, it improves their HgA1C while decreasing mortality associated with poor DM management and increases their quality of life (Rav-Marathe et al., 2016). Advanced practice registered nurses (APRNs) have a unique skill set to facilitate patient education to support preventative medicine rather than reactive medicine.

With the increasing elderly population, APRNs are becoming more valuable as they open more clinics to support the population's overwhelming need for clinicians. According to the *ADA's Standards of Medical Care in Diabetes* report (2016), 11.2 million or 25.9 % of people 65 years old or older had diabetes. Continuing education like DMSE and developing a partnership

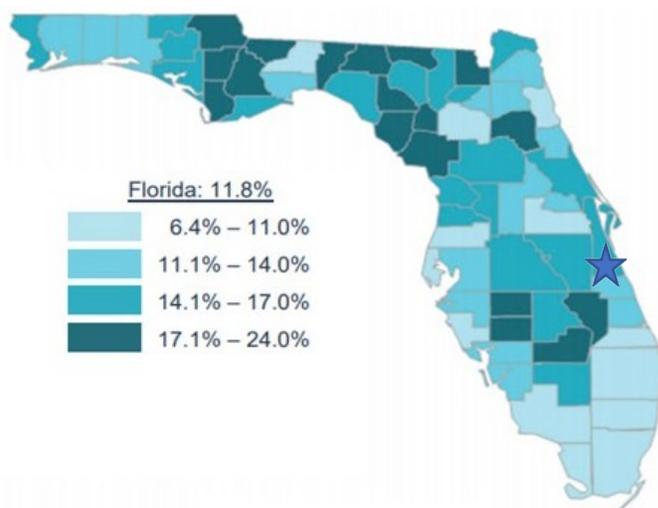
between the patient and the clinician is essential to managing diabetes. Patients who receive DSME show a reduction in utilization of healthcare services such as outpatient and ED visits and medical and pharmaceutical costs (Turner et al., 2018). Additionally, DSME can reduce chronic co-occurring conditions seen with uncontrolled DM, such as hypertension, hyperlipidemia, and depression (Turner et al., 2018).

Local Problem

According to the *500 Cities Project: Local Data for Better Health* (CDC, 2020), in the Fort Pierce, FL area, approximately 7.9%-13.7% of adults are diagnosed with DM (CDC, 2020). About 25% of DM cases are undiagnosed, meaning the crude prevalence is much higher (CDC, 2017). Over two million people in Florida, or 13.1% of the population, have DM, with an additional 5.8 million people diagnosed as prediabetic, as seen in Figure 2 (ADA, 2017).

Figure 2

Florida Prevalence of Diabetes by County



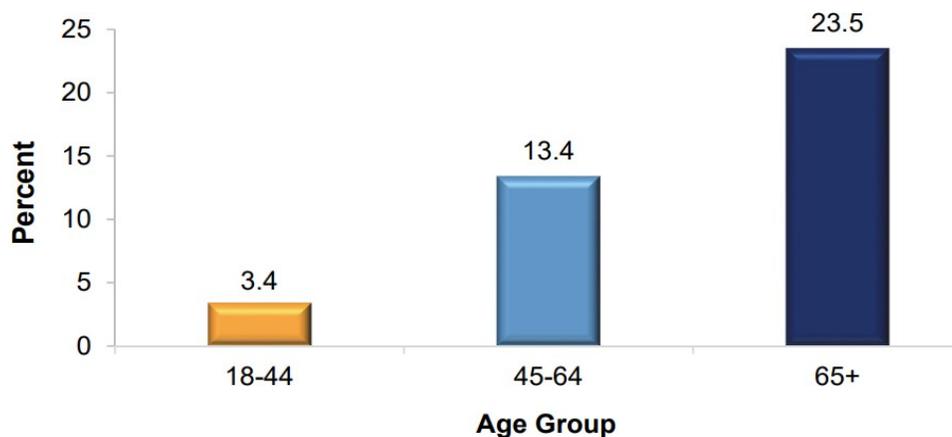
Note. Florida, 2016. Retrieved from Florida Diabetes Advisory Council, 2019.

DM patients have increased medical care costs at a rate of approximately 2.3 times higher than the population without DM (ADA, 2017). In 2012 Florida's medical expenses for diagnosed, undiagnosed, prediabetes, and gestational diabetes were over \$19 billion, and another \$5 billion in indirect costs from lost productivity (ADA, 2017). Additionally, in 2015 and 2016, the National Institute of Diabetes, Digestive and Kidney Diseases and the CDC spent over \$86 million for diabetes-related research, diabetes prevention, and educational programs (ADA, 2017).

Florida has the second largest population of adults over 65 years of age in the US, which raises concern about the increasing prevalence of DM in this aging population (Figure 3) (Florida Diabetes Advisory Council, 2019).

Figure 3

Florida Prevalence of Diabetes by Age Group



Note. Figure obtained from Florida Diabetes Advisory Council, 2019

According to the Florida Diabetes Advisory Council, costs to Florida Medicaid related to DM were \$248 million in 2017, with the footnote, this approximation is likely underestimated

(Florida Diabetes Advisory Council, 2019). Diabetes-related diseases have also been rising, with cardiovascular disease, kidney disease, and obesity leading. Approximately 25.8% of adults with DM had a history of cardiovascular disease, 9.4% had chronic kidney disease, and 47.7% were obese, compared to 7.7%, 2.3%, and 24.7%, respectively (Florida Diabetes Advisory Council, 2019).

Through a need assessment conducted at a primary care practice in Fort Pierce, FL, a knowledge gap existed when patients with diabetes talked about their dietary practices to control blood glucose levels, improve their HgA1C, and promote weight loss. Patients often reported eating “correctly” for diabetic management when eating bananas, yogurt, cereal, and milk for breakfast. There was a deficit in education given to patients regarding nutrition and the importance of low carb/high protein diets. APRNs and physicians often lack the time necessary to devote to DM patients to provide evidence based DSME.

Stakeholders include the project champion (APRN), the clinic physician, the patients and support staff, and the project manager. For an intervention to be valuable and successful, a collaborative quality improvement team should be comprised, that provides frequent feedback and revisions if necessary (Hilton & Anderson, 2018).

Intended Improvement

Project Purpose

This DNP quality improvement (QI) project aimed to assess the feasibility and usability of educational videos to improve diabetic patients’ knowledge on diabetes self-management. This project helped providers understand what their DM patient population needs to facilitate self-management of diabetes and decrease costs associated with the inability to manage diabetes.

If the outcome is successful, the educational intervention could be implemented long-term at the site as a practice change to improve patient knowledge and self-management of DM and DM control.

Project Question

This DNP project addresses the following PICO question: For diabetic patients at a family practice clinic, does an educational intervention focused on a high protein and low carbohydrate diet increase patient knowledge of diabetes self-management and improve patients' perceived quality of life?

Project Objectives

This DNP project's predicted outcome was an increase patient knowledge regarding guidelines of a high protein, low carbohydrate diet; an increase in patients' self-management confidence, and an increase in patients' perceived quality of life following an educational intervention. The outcomes were assessed through a pretest and posttest survey (Appendix D) analyzed before and after the educational intervention (Appendix E).

Theoretical Framework

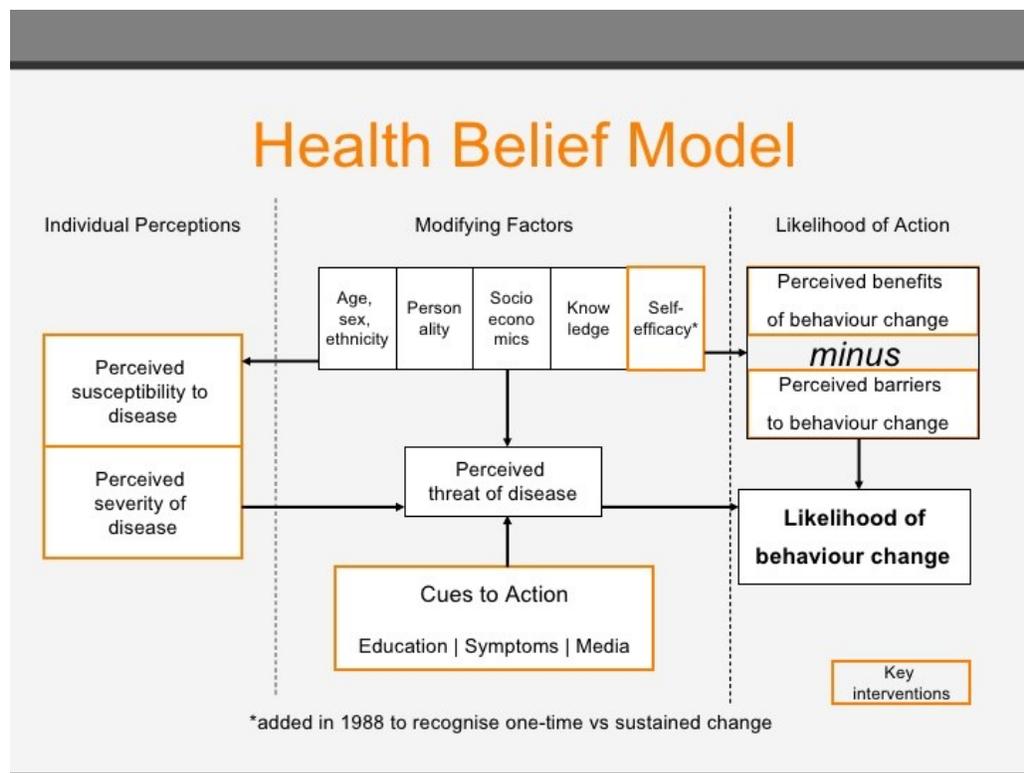
Diabetes self-management is only effective when patients learn to practice self-care with the confidence necessary to execute and maintain new behaviors. One model that helps design a health promotion initiative is the health belief model (HBM). HBM is a relevant model to help guide behavior change for DSME. HBM allows providers to assess patients' views on their illness and their experience on how it affects their life (Zazworsky & Carpenito-Moyet, 2007). Knowing the patients' beliefs and values will enable practitioners to evaluate patients' readiness

to change. This model assesses the patient's readiness to act on a change in health behaviors based on several beliefs:

1. Perceived susceptibility - the perception of the patient's vulnerability to a condition or disease
2. Perceived severity - the patient's perception of the seriousness of their disease or illness
3. Perceived benefits - the patient's perceived benefits of acting or the value of the changed behaviors
4. Perceived barriers - the patient's perceived obstacles to making behavior changes being considered (Simpson, 2015).

Figure 4

Health Belief Model Schematic



Note. Figure obtained from Health and Social Marketing Workshop, SlideShare, 2019

Patients will be likely to modify their behaviors if they believe they are susceptible to disease, and that its consequences could be severe if the condition is not appropriately managed (Simpson, 2015). The chances the patient will modify their behaviors are enhanced if their perceived benefits outweigh the perceived barriers (Simpson, 2015).

Another aspect of this model that makes it appropriate for DSME includes other constructs like cues to action and self-efficacy (Simpson, 2015). Cues to action are things that inspire a patient to begin to change their behavior. Cues to action vary from patient to patient and are best when evaluated on a case-by-case basis, so they are tailored to the patient (Zazworsky & Carpenito-Moyet, 2007). For instance, one patient might be motivated to control her blood sugar through diet to control damage to her kidneys because she wants to live a healthier life for her young daughter. Whereas another patient may be retiring next year and has plans to go sailing, he wants to avoid dialysis. Self-efficacy is when the patient's self-confidence is high enough to successfully carry out the new behaviors on their own (Simpson, 2015).

Strategies to use with diabetic patients to encourage participation in DSME include framing the DSME program according to information from the pre-implementation knowledge assessment. Once the pretest is administered, the educational module can target the patients' perceived susceptibility to their increased risk of developing illnesses related to uncontrolled diabetes. The module can be tailored to patients' perceived benefits of behavior change, including improved quality of life. Additionally, the education will address barriers to behavior change to decrease risk and enhance benefits.

By clarifying the risks and benefits, they will be provided "cues to action" (Zazworsky & Carpenito-Moyet, 2007). Patients who face the harmful consequences of not managing diabetes

will be more inclined to act and participate in education to promote self-efficacy (Zazworsky & Carpenito-Moyet, 2007). Using HBM, the provider can gain a unique perspective into the patients' cues and make a behavioral change to become more self-sufficient in managing their disease (Zazworsky & Carpenito-Moyet, 2007).

Literature Synthesis

Evidence Search

A literature review was conducted to explore current DSME recommendations and guidelines using Cumulative Index of Nursing and Allied Health Literature (CINAHL) and PubMed. The search was narrowed using the following variables: "diabetes," "self-management," "education," "primary care," "protein," "low-carb," and "practices." The initial search yielded 226 articles. Inclusion criteria were full-text articles, English language, adults ages 19 and over, and humans, narrowing the total articles to 71. Both searches excluded articles over five years old. After excluding articles that did not contain diet/protein, DSME, and opinion-based, the total number of articles reviewed was 19.

Relevant clinical practice guidelines were reviewed to identify gaps in the research, professional procedures, systematic reviews, and independent studies. The search was expanded to include articles from the past six years to retrieve more data about contraindications to high protein diets for DM patients. 19 articles were included for use in this project and are further discussed below and presented in Table 1.

Comprehensive Appraisal of Evidence

The ADA's current recommendations state all patients with diabetes should receive DSME at diagnoses and as needed to improve patient care and education, improve the health of

patients and populations, and reduce health care costs (ADA, 2019). A 2019 consensus report using randomized controlled trials, systematic reviews, and meta-analyses of randomized controlled trials details the importance of medical nutritional therapy (MNT), and DSME for patients with diabetes (Evert et al., 2019). The report strengthens the ADA's recommendation for referral of diabetic patients to diabetes-focused MNT and DSME on an ongoing basis and when there is a change in the patient's health status (Evert et al., 2019). The ADA recommends that people with prediabetes and diabetes receive DSME to prevent or delay the development of type 2 diabetes (T2DM) and its complications (evidence level B) (ADA, 2019).

The initial diagnosis of diabetes can be overwhelming. It is primarily a disease expected to be self-managed; however, most patients do not receive guidance on managing their new chronic condition. DSME referral needs to be made at the time of diagnosis to provide a plan of care, ongoing education, practical strategies, and goals (Powers et al., 2020). Generally, patients who have a sense of self-control over their disease experience less depression, with increased self-confidence and self-efficacy (Turner et al., 2018). DSME improves HgA1C on average 0.45-0.57%, reduces diabetes-related complications, decreases mortality, improves the quality of life, and promotes positive lifestyle behaviors, healthy coping, and self-efficacy (Powers et al., 2020). The goals of DSME are to use healthy eating to improve overall health status, decrease HgA1C, achieve and maintain a healthy weight, and delay and prevent complications of diabetes.

Strengths of Evidence

Many of the studies identified a lack or absence of education due to time constraints placed on providers. The CDC reported that only 6.8% of newly diagnosed DM patients with private insurance were referred to DSME within 12 months of diagnosis. Only 5% of Medicare

patients were referred in the first year of diagnosis (Powers et al., 2020). All studies emphasized the economic impact diabetes has on the nation and population. In 2012 diabetes and related costs were approximately \$245 billion, and DSME can effectively reduce these costs by increasing patients' ability to manage the disease (Powers et al., 2020). In a study by Turner et al. (2018) comparing a group of diabetic patients (N= 558) getting DSME to another group with standard care (N= 1669), they showed a statistically significant decrease in healthcare costs for the intervention group, for inpatient ($P=.01$), emergency department ($P=.003$), and outpatient ($P= .001$) (Turner et al., 2018). They all identified the need to educate patients and recognized that diabetes diagnosis is becoming more common and is being diagnosed at younger ages. By 2050 it is estimated that one in three people will have DM, and the US cannot afford the costs associated with patients unable to manage their disease (Powers et al., 2020). DSME improves HgA1C and slows the advancement of comorbidities related to diabetes, enhancing the patient's self-efficacy.

Articles reviewed regarding protein intake DSME revealed that protein intake for diabetic patients is associated with increased muscle mass (Sandouk & Lansang, 2017). Additionally, protein intake is associated with higher skeletal muscle mass and strength (Sandouk & Lansang, 2017). High protein diets include diets that would be 30% of the patient's caloric needs throughout the day (Miki et al., 2017). High protein diets, where over 30% of calories are from protein sources, have been shown to contribute to weight loss up to 5.2kg in 12 weeks, lower low-density lipoprotein cholesterol, and reduce abdominal fat (Sandouk & Lansang, 2017). Ajala et al. (2013) reviewed 20 clinical trials that used high protein diets in DM patients for more than

six months. In these studies, HbA1C levels were reduced by 0.28%, and mean serum fasting glucose levels decreased by 72 mg/dL compared to control diets (Sandouk & Lansang, 2017).

Weaknesses of Evidence

Conflicting studies report arguments against high protein intake. Mattos et al. report a possible association between high protein intake among DM patients and uncontrolled blood pressure. In a cross-sectional study of 121 patients with DM (2015), there was an association between elevated blood pressure and increased protein intake (odds ratio [OR]=1.16;95% confidence interval [CI], 1.02, 1.03; $p=0.02$) (Mattos et al., 2015). Moreover, increased protein intake by more than 3.08g/kg weight/day was associated with a more than double chance for uncontrolled blood pressure (Mattos et al., 2015). Suggesting high protein diets may not be suitable for DM patients with uncontrolled high blood pressure (Mattos et al., 2015). However, the protein sources were not delineated. A meta-analysis from 2013 of high protein intake studies in DM patients yielded no statistically significant impact on blood pressure (Evert et al., 2019).

The ADA recommends evaluating patients' renal profiles before recommending high-protein diets and individualizing their diet based on kidney function. Patients with early chronic kidney disease should have 0.8g/kg-1.0g/kg of protein per day, and patients with advanced kidney disease should be limited to 0.8g/kg of protein per day (Sandouk & Lansang, 2017). A 12-week study of DM patients consuming 30% or 15% of daily nutrients as protein resulted in improved weight, fasting glucose, and glucose-lowering medicines in the group who consumed 30% protein (Evert et al., 2019).

Additional research recommends that DM patients follow a low carbohydrate diet. Sandouk and Lansang (2017) indicate that although a low carbohydrate diet provides rapid

weight loss (11.4kg over six months, with HgA1C reduction of up to 2.2%), there were also reports of increased high-density lipoprotein cholesterol and weight regain, if not adhered to.

Gaps and Limitations

The number of patients who receive DSME with recently diagnosed diabetes is approximately 6.8% (ADA, 2019). Barriers to patients receiving DSME can include a lack of understanding of the importance of DSME, patient and provider resources, and misunderstanding of cost reimbursement (ADA, 2019). The studies' limitations include unobserved and undocumented health literacy issues, coping strategies, lifestyle behaviors, and compliance. There are no studies to show the effects of a low carbohydrate, high protein diet on cardiovascular risk (Turner et al., 2018). Study results are limited due to high dropout rates, poor adherence, increased weight regain incidence, or low durability of interventions. Interventions targeted at DSME need to be multidisciplinary, tailored to the patient, and reinforced by the provider to solidify the patient's change in behavior and lifestyle to remain successful. The studies evaluated for this QI project indicate the educational programs vary in their delivery method, whom they are taught by, their incentives, and the intensity of the intervention. The varied programs and populations who participated in the studies make it difficult to generalize to diabetic patients (Turner et al., 2018).

METHODS

Project Design

This quality improvement (QI) project used a pretest/posttest quantitative design based on an evidence based DSME intervention. The purpose was to assess and evaluate the response of patients before and after DSME. The intervention focused on a high protein, low carbohydrate

diet introduced to one group of diabetic patients (N=6). The pretest and posttest design measured changes from baseline after the intervention on patient knowledge of diet and impact of diet on diabetes self-management and intention to change. The posttest helped measure the improvement of participants' understanding and the effectiveness of the intervention.

Another purpose of the QI project was to assess patients' perception of the educational module and the results of their learning just after the module. An added objective was to address the gap in practice at this clinic for DSME and incorporate this education into the clinician's routine when patients are diagnosed with diabetes or are struggling with self-management. The pretest measured participants' baseline diabetes self-management knowledge and their knowledge regarding how certain foods impact their blood sugars. The pretest utilized 5-point Likert scale questions, taken via email through Qualtrics (Appendix D). The posttest survey was administered similarly with a 5-point Likert scale, completed immediately after completing the educational module (Appendix E). The total time necessary for the intervention was approximately 20 minutes. These results enabled the project leader and the stakeholders to identify the intervention's strengths and weaknesses in improving the participant's knowledge.

Model for Implementation

The health behavior model (HBM) helped develop the education and motivate patients to change their behavior to benefit their health. The Model for Improvement (MFI) (2009) helped guide the project design, set goals, identify accomplishments, measure improvements, and select the change that resulted in improvement (Hilton & Anderson, 2018). The IHI Model for Improvement (MFI) uses a PDSA (Plan-Do-Study-Act) cycle. Each cycle allows the project champion to evaluate the change and make small changes based on the outcome before project

implementation on a larger scale (Hilton & Anderson, 2018). Using the MFI will help improve patient outcomes while reducing healthcare costs; Specifically, costs associated with adverse consequences from poor diabetes management.

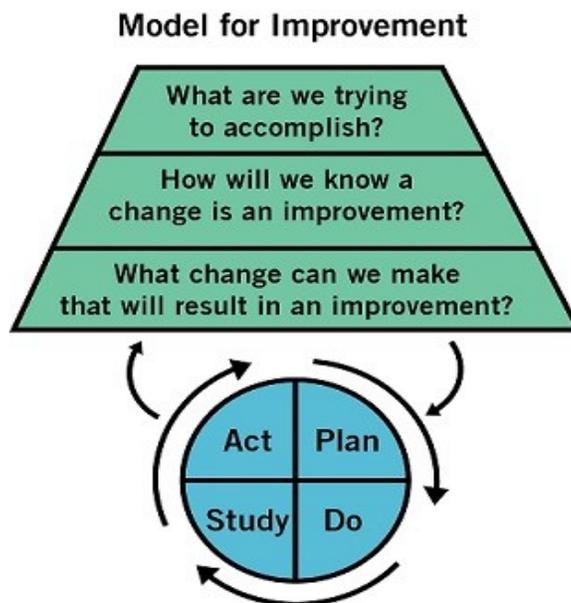
During the planning stage, the project leader determined when the intervention occurred, how many will be involved, and who will be involved. During the first cycle, the PI contacted and sent the pretest, DSME, and posttest through Qualtrics to 16 patients referred to the PI by the clinicians. Each participant received a disclosure with the first email accompanying the pretest (Appendix B). Completion of the pretest indicated consent. After four weeks, the surveys were closed, and the project leader could evaluate the need to modify the educational model based on the patient's knowledge improvement. A total of six (N=6) patients completed the QI project.

The pretest provided a baseline to determine if a change occurred and whether it was an improvement. The study portion of PDSA helped determine what went well, the barriers encountered, and act on what was learned to change the plan if necessary. Utilizing the HBM allowed the project champion to assess the patient's readiness for change, perceived benefits of the intervention, and its impact on their health.

Time constraints prevented another test cycle, but the intervention allowed the clinic to see the results and consider refinements to the project based on sustainability and feasibility. The results from the surveys were compiled in an Excel spreadsheet with analysis and summary for the primary care clinic to reference. The summary outlined if a change occurred, what was learned, and the sustainability of the project.

Figure 5

IHI Model for Improvement, and PDSA Cycle



Note. Figure obtained from Institute for Healthcare Improvement, *How to Improve with the Model for Improvement*, 2018.

Setting and Stakeholders

The QI project setting was at a primary care practice located in Fort Pierce, Florida. The clinic is a moderately sized family practice with one Doctor of Osteopathy (DO), one Advanced Practice Registered Nurse Practitioner (APRN) (NP), two medical assistants (MAs), and four office staff members. Many of the patients comprise older adults with Medicare. There are approximately 50 patients scheduled each day to see the providers, with other patients due for vaccinations and blood draws. There is an on-site laboratory with an on-site pharmacy. The volume of patients for two providers leaves very little time to incorporate DSME into the patient's visits. The clinic has several rooms which were available to the project leader to

conduct individual interviews and for patients to view the educational module and complete their surveys. However, due to the COVID-19 pandemic, the patients were offered to complete the DSME on their own time via email links sent by the PI.

Due to the COVID-19 pandemic and a recent upsurge in cases in the local area, the project utilized the online survey platform Qualtrics. Qualtrics was used to anonymously send the pretest, DSME links, and posttest via email to the participants. Qualifying and interested patients supplied their email addresses after telemedicine appointments. The healthcare providers at this clinic were aware of the QI project and identified potential participants with DM who struggle with diet management to the project leader. The healthcare providers granted permission to use their facility for this project and recruit patients from their clinic (Appendix A).

Planning the Intervention

This project's intervention was an educational presentation focused on DSME and high protein and low carbohydrate diets developed using guidelines from the ADA on DSME (Appendix E). The project and its purpose were explained to potential participants, and willing participants indicated consent by completing the pretest survey. The project leader was available to answer any participants' questions via email or phone call while completing the pretest survey. The questions were 5-point Likert Scale type focused on DSME. They focused on how much knowledge the participant had regarding diet, its impact on blood sugar levels, and their belief in their self-management ability (Appendix D). There were also five multiple-choice questions regarding the patients' knowledge of diabetes. Once complete, the patient watched the educational videos (Appendix E). The learning session was approximately 5 to 10 minutes in length, depending on the patient's engagement.

Immediately after completing the educational session, the participants completed the posttest survey. The posttest consisted of 5-point Likert scale-type questions focused on the patients' ability to manage their diabetes and how diet affects diabetes and blood sugar levels. Additional knowledge-based questions regarding the patient's intention to change based on their new knowledge were also included (Appendix D).

Participants and Recruitment

A convenience sample of diabetic adult patients was recruited for this QI project. Criteria for sample inclusion were a) Over 18 years of age, b) a diagnosis of DM type II, and c) identification by the provider as a patient who could benefit from DSME. Exclusion criteria were a) type I DM patients, b) patients under 18 years of age, and c) patients with well-managed DM (H_gA₁C ≤ 6.4%). The project leader was the only person administering the pretest/posttest(s) (Appendix D) and educational modules (Appendix E). To gain maximal participation, the providers referred potential participants with DM who struggled with diet management to the project leader. The project leader explained the benefits of managing diabetes by eating better to the potential participants. The primary care office may adopt a DSME program for newly diagnosed DM patients if the QI project is successful. The objective is to gather data from at least ten to twenty patients over a one-month timeframe.

All participants received a project disclaimer read to them and emailed to them (Appendix B). The project leader replaced the participants' names with random 4-digit codes to de-identify participants and adhered to the Health Insurance Portability and Accountability Act of 1996 (HIPAA). This document was kept solely by the project leader in a password-protected

computer, in a password-protected folder, in a password-protected file. All records once scanned and saved, were shredded.

Consent and Ethical Considerations

Approval for this project was obtained from the University of Arizona College of Nursing Departmental Review Committee. The project was determined not to research as defined by 45 CFR 46.102(1) and did not require oversight by the Institutional Review Board of the University of Arizona (Appendix A). Institutional review board (IRB) approval was obtained before any human subjects' involvement according to fundamental ethical standards outlined in the Belmont report. These standards outline three ethical principles: Respect for persons, beneficence, and justice. The project leader will follow these for this QI project to uphold the participants' safety, ethics, and consistency.

Respect for the individuals involved was maintained by ensuring autonomy, allowing the participants to voluntarily be involved in the project and withdraw from the QI project at any time (Polit & Beck, 2017). Consent outlined the participant's voluntary participation and ability to withdraw at any time (Appendix B). The informed consent disclosed the description of the project, the benefits, and the risks of participation. The risks were minimal as there were no physical adverse effects of DSME. It also emphasized that participation is voluntary, and patients could withdraw at any time or not answer questions they felt were too personal. Emails for pretests and posttests sent via Qualtrics contained 'opt-out' links and ensured that patients' information was not recorded.

Beneficence was upheld as the primary purpose of this QI project was to do good (Polit & Beck, 2017). The project aims to understand how much benefit the DSME intervention can

provide to patients and has little to no risk of harm. Justice is the last standard in the Belmont report. Justice means the participants had the right to maintain privacy, equal treatment and that the project is non-discriminatory (Polit & Beck, 2017). Patients were treated fairly and equally regardless of their race, ethnicity, sexual identification, and education level.

Data Collection

Data collection started after all participants completed the pretests/posttests and education via Qualtrics over one month (30 days). Email reminders were sent to participants four days before project closing and one day before project closing. The participant's tests were identified with their assigned 4-digit code to avoid name identifiers. The surveys' data comprised material ascertained from other questionnaires like the Diabetes Knowledge Questionnaire, the Diabetes Self-Management guide by Medicare Quality Innovation Network in collaboration with CMS, and the ADAs Standards of Medical Care Diabetes Self-Care Workbook. The information was transferred to an Excel spreadsheet, with the participant's initial demographic data and their given number. This data included age, gender, education level, and year of diagnosis (Appendix D). The project leader was the only person who had access to this information. With all the data acquired, the documents were destroyed, as per HIPAA guidelines.

Data Analysis

Demographic information was collected to describe the sample and is displayed using percentages and graphs. The results from the pretest survey were compared to the posttest survey using descriptive statistics. Using the 5-point Likert Scale, the project leader calculated the mean, median, and mode for the response to each question collectively from the pretests and posttests. The changes in the answers in the pretests and posttests were then compared and are displayed

using graphs. Mean changes in each response show the effectiveness of the educational intervention on the participants and their ability and intention to take a more active role in managing their diabetes. The PI was the only person with access and the password to view and evaluate the responses in Qualtrics.

Comparing the Likert scale results of the pre- and post-surveys were analyzed according to the responses. The mean and the standard deviation were calculated and used to distinguish the differences between each question's pretest and posttest responses. Data were calculated and displayed graphically. Given the small number of participants and the ability to present the information before and after the intervention using more basic statistical methods, the author opted to utilize The Wilcoxon-signed rank test. The five-point Likert scale questions were evaluated using the mean, mode, and median of the responses: "Strongly Disagree = 1", "Somewhat Disagree = 2," "Disagree = 3," "Somewhat Disagree = 4," "Agree = 5," and "Strongly Agree = 6."

RESULTS

Outcomes

Sixteen patients were invited to participate in the QI project via phone call and agreed to participate in the QI project giving the PI their email address. They were all sent emails with the presurvey information, and a total of six patients completed both the pretest and posttest (N=6). The pretest contained self-reported demographic data collected and displayed in Table 1. Based on the demographic data collected, the average age of the patients was 57.8 years (range 56-65, SD= 1.5), with 83% female and 17% male. Almost all the participants had never participated in a diabetes educational program before (83%, SD=0.37). 50% reported they had diabetes for less

than two years, while the other 50% said they had diabetes more than three years, with two participants indicating they were diagnosed more than eight years ago. Most patients reported they had graduated high school, while 50% revealed they had had formal education beyond high school with one post bachelor's degree.

Table 1

Demographics

Variable	All
Total Participants	6
	N (%)
Male	1 (17%)
Female	5 (83%)
Age	
26-35yo	1 (17%)
46-55yo	1 (17%)
56-65yo	2 (33%)
66-75yo	2 (33%)
Att. Edu Before	
Yes	1 (17%)
No	5 (83%)
Highest Edu.	
High School	3 (50%)
Assoc.	1 (17%)
Bachelor's	1 (17%)
Post Bachelor's	1 (17%)
Years w/ DM	
0-2	3 (50%)
3-5	1 (17%)
9-11	1 (17%)
15+	1 (17%)

Pre-survey Data

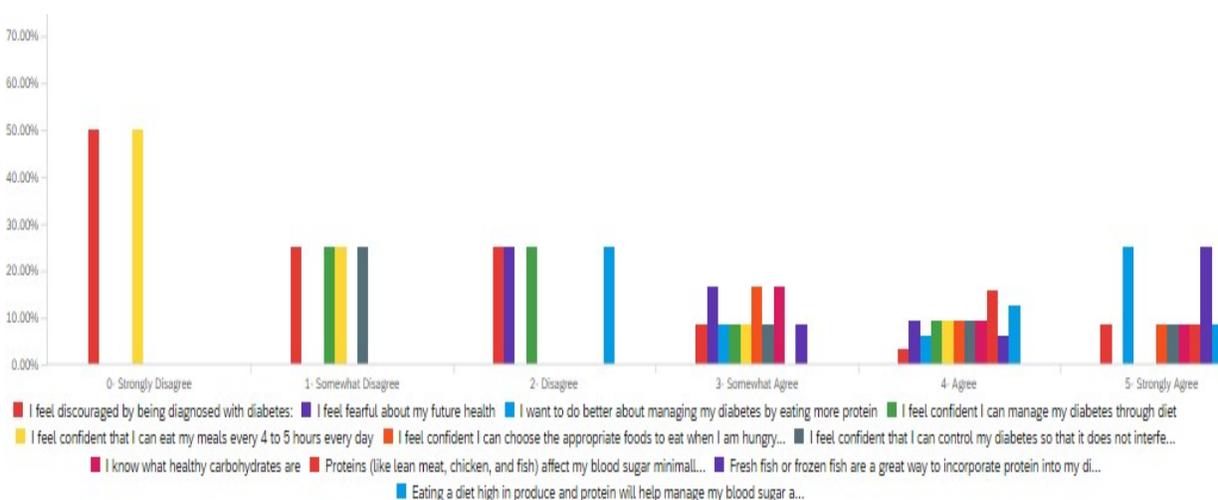
Most participants (83%) reported they had never had any diabetes education (virtual, online, or in-person) at all, and most of the participants were female (83%). Most participants were over the age of 56, with at least a high school education, and the majority had been diagnosed with diabetes for less than 11 years.

Eleven five-point Likert-scale items measured participants' knowledge and perception of self-management of their diabetes. Pre-survey data revealed that participants were fearful about their future health, with 50% reporting "Somewhat Agree" (Mean 3.5, SD= 1.12).

Approximately two patients (Mean 2.5, SD= 1.8) stated they knew what healthy carbohydrates were (33% recording "Somewhat Agree"). Another two (Mean 2.0, SD=1.83) felt that fresh fish were a great way to incorporate protein into their diet (33% "Agree"). Half of the participants (Mean 2.17, SD= 1.67) felt confident they could manage their diabetes through diet by recording "Agree" and felt that proteins affected their blood sugar minimally (Mean 2.33, SD=1.70).

Figure 6

Pretest Likert-scale Question Responses



Post-survey Data

All six participants completed the post-survey. The goal was to increase patient knowledge regarding a high protein, low carbohydrate diet, patients' self-management confidence, and improve patients' perceived quality of life following an educational intervention. The Wilcoxon-signed rank test with a p-value set at 0.05 for statistical significance was used to measure the change in the knowledge and confidence of the questions mentioned in the pretest: "I feel fearful about my future health," "I know what healthy carbohydrates are," "fresh fish are a great way to incorporate protein into my diet," "I feel confident I can manage my diabetes through diet," and "proteins affect my blood sugar minimally."

After completing the educational videos, the mean response to "I feel fearful about my future health" decreased from 4.4 to 3.8 to 4.4, with 50% of participants reporting "Agree." Posttest, vs "Strongly Agree," pretest (SD=0.8).

Figure 7

Pretest/Posttest Survey Data - "I Feel Fearful About My Future Health"

Pre-survey data

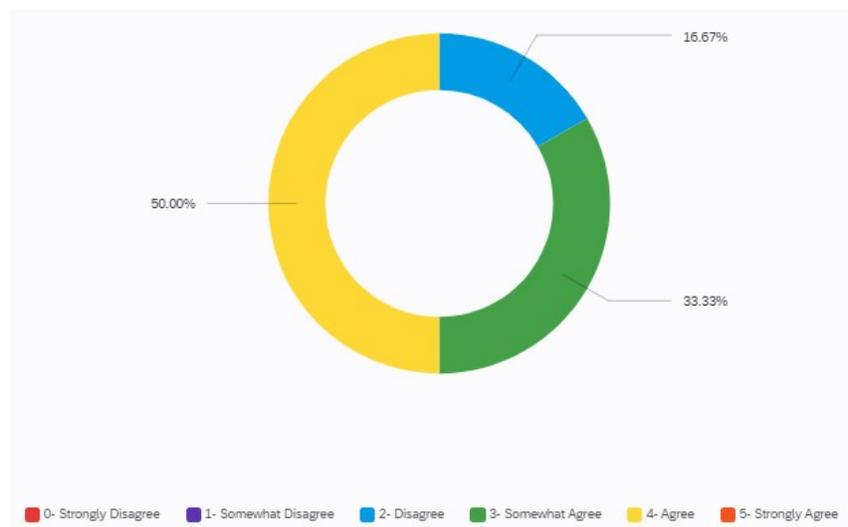
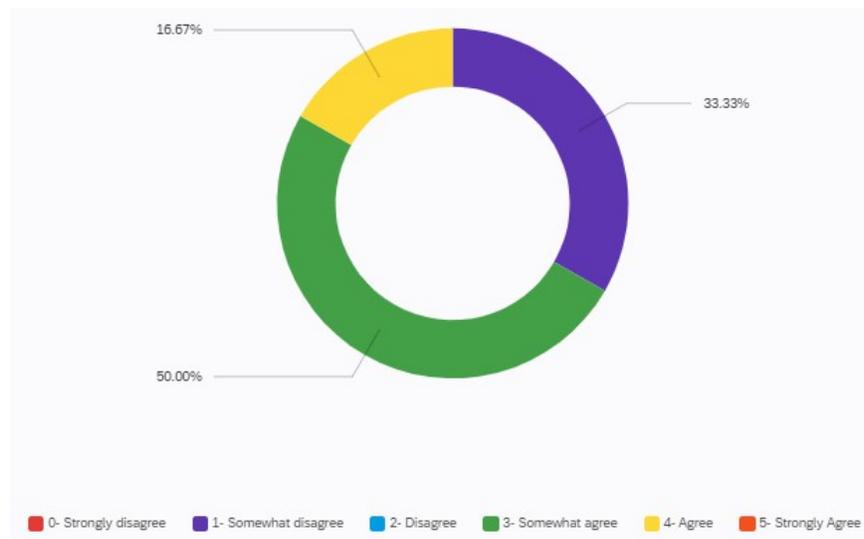


Figure 7 – Continued

Post-survey data

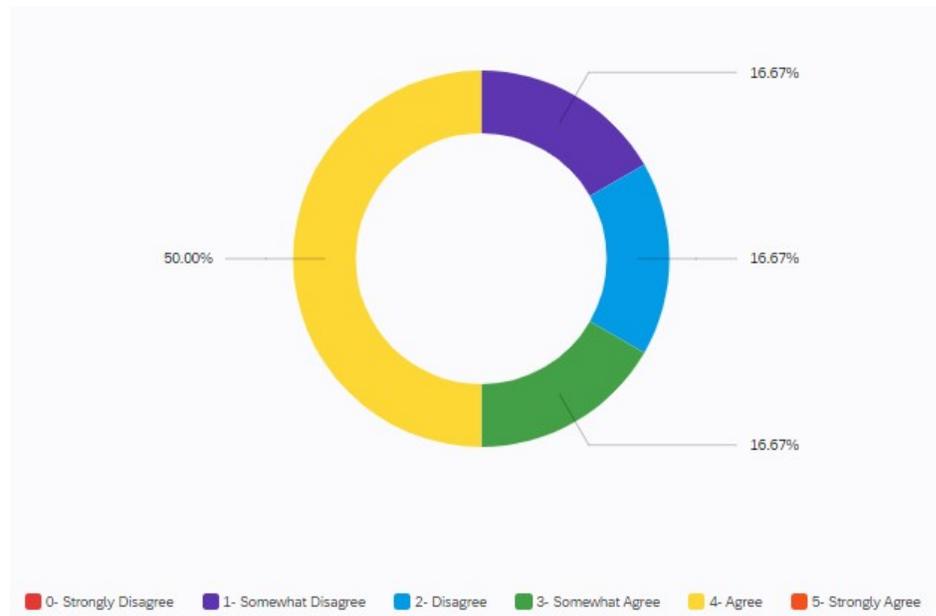


The mean response for participants' knowledge regarding healthy carbohydrates increased from 2.5 to 4.8, with 50% of answers changing to "Agree." Half of the participants "strongly agreed" that 'fresh fish was a great way to incorporate protein into their diet,' increasing 34% from the presurvey. The mean increased to 4.0 (SD= 1.15) from 2.17 for the topic of "I feel confident I can manage my diabetes through diet." Almost all participants (83%) recorded "Strongly Agree" that 'proteins affected their blood sugar minimally after watching the videos,' compared to nearly all participants who disagreed with that statement prior.

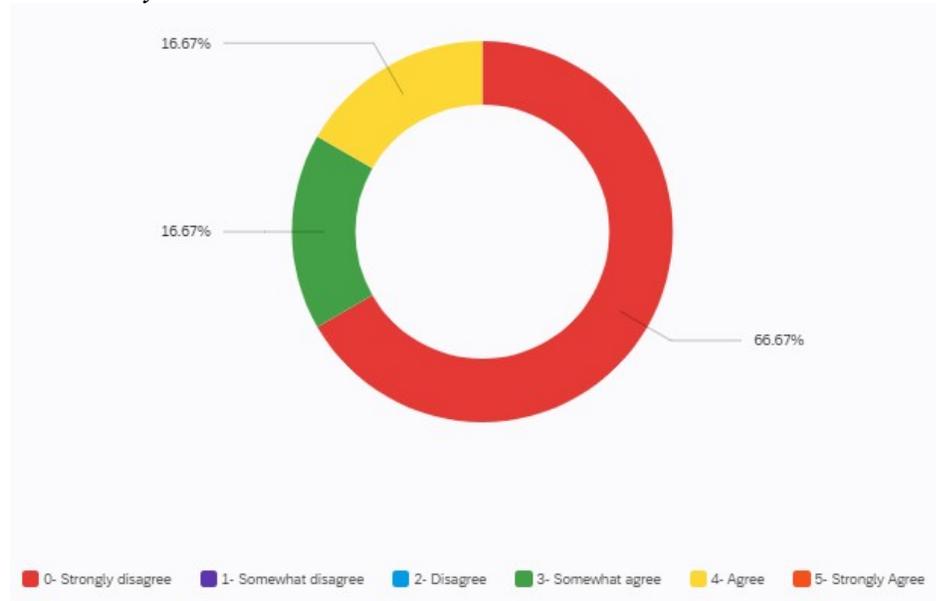
Figure 8

Pretest/Posttest Survey Data - "I Feel Confident I can Manage my Diabetes Through My Diet"

Pre-survey data



Post-survey data



The Wilcoxon-signed rank test with p-value set < 0.05 , comparing the above-mentioned questions indicated a statistically significant difference, p-value = 0.00902 (Table 2).

Table 2

Wilcoxon Rankings

Observation	Rank	Sample
2	1	A
2.17	2	A
2.33	3	A
2.5	4	A
3.5	5	A
4	6	B
4.3	7	B
4.83	8	B
5.17	9	B
5.33	10	B

When calculating the p-value for all 11 variables using the Wilcoxon-signed rank test, there was also a statistically significant difference with $p=0.0008$.

Table 3*Statistics for Diabetes Knowledge and Self-efficacy*

Knowledge	Pretest		Posttest	
	<i>Mean</i>	<i>Mean</i>	<i>Difference</i>	<i>Std. Deviation</i>
I know what healthy carbohydrates are	2.5	4.83	(2.33)	1.8/0.69
Proteins (like lean meat, chicken, and fish) affect my blood sugar minimally	2.33	5.17	(2.84)	1.7/0.37
Fresh fish or frozen fish are a great way to incorporate protein into my diet	2	5.33	(3.33)	1.83/0.75
Eating a diet high in produce and protein will help manage my blood sugar and A1C level	2.67	4.83	(2.16)	1.7/0.81
Self-Efficacy	Pretest		Posttest	
	<i>Mean</i>	<i>Mean</i>	<i>Difference</i>	<i>Std. Deviation</i>
I feel discouraged by being diagnosed with diabetes	3.8	3.5	0.3	1.49/1.71
I feel fearful about my future health	3.8	4.33	(0.53)	1.12/0.75
I want to do better with managing my diabetes by eating more protein	1.8	5.33	(3.53)	1.37/0.75
I feel confident I can manage my diabetes through diet	1.6	4	(2.4)	1.67/1.15
I feel confident that I can eat my meals every 4 to 5 hours every day	2.2	4.83	(2.63)	1.37/1.60
I feel confident I can choose the appropriate foods to eat when I am hungry (for example, snacks)	2	4.5	(2.5)	1.50/0.69
I feel confident that I can control my diabetes so that it does not interfere with the things I want to do	1.8	4.83	(3.03)	1.60/1.26

DISCUSSION**Summary**

The purpose of this QI project was to assess the feasibility and usability of evidence-based educational videos to improve diabetic patients' knowledge of diabetes self-management. The project aimed to answer the following question: "For diabetic patients at a family practice clinic, does an educational intervention focused on a high protein and low carbohydrate diet increase patient knowledge of diabetes self-management and improve patients' perceived quality of life?"

Utilizing DSME focusing on nutrition as an evidence-based intervention is shown to reduce mortality, secondary comorbidities, and associated costs for patients and providers (Sandouk & Lansang, 2017). Adjusting dietary habits to focus on low carbohydrates and increased protein intake improves glucose control and insulin secretion and sensitivity (Comerford & Pasin, 2016). Providing education for patients focused on meal planning and nutrition, with protein's importance as the primary caloric intake source, is often challenging for providers (Campbell & Rains, 2015). Quality improvement (QI) projects like improving diabetic patients' knowledge of the importance of protein intake for better self-management of HbA1C help ensure patients receive the care and services needed to maximize life expectancy and quality of life. This evidence-based intervention, using videos on DSME, benefits patients and providers alike.

This QI project helped providers understand what their DM patient population needs to facilitate self-management of diabetes and decrease costs associated with the inability to manage diabetes. Using an evidence-based educational intervention to improve self-management confidence for diabetic patients proved to impact the patients who participated in this QI project positively. The goal of improving patients' knowledge regarding protein and carbohydrate intake and how they affect blood sugar was also achieved. Overall, the participants increase in knowledge was 45%, and their increase in confidence was 42%. Participants overall increase in their perceived quality of life after the intervention was 73%.

In the future, the primary care clinic could adopt these videos into the video loop which plays in the patient rooms or the waiting room to help improve diabetic patients' health outcomes and self-management. These changes could be done in the next PDSA cycle, improving patient

participation. Literature suggests that less than 50% of diagnosed diabetic patients have received dietary education based on current practice guidelines (Mohammedi et al., 2016). To meet the aims delineated by the Institute of Medicine's (IOM) *Crossing the Quality Chasm*, patients with chronic illnesses like diabetes need DSME and support for self-management (Mohammedi et al., 2016). However, the number of patients who receive DSME with recently diagnosed diabetes is approximately 6.8% (ADA, 2019). The pre-survey data was consistent with current literature, with only one patient out of the six (17%) participants stating they had attended any diabetic education before. Barriers to patients receiving DSME during this QI project were also consistent with the current literature. Barriers for patients and providers can include a lack of understanding of the importance of DSME, patient and provider resources, and misunderstanding of cost reimbursement (ADA, 2019).

The HBM was appropriate for this QI project as the patients who participated were contacted to participate in part by provider recommendation. These patients were having difficulty managing their diabetes and had rising HgA1C numbers requiring additional pharmaceutical management. HBM allows providers to assess patients' views on their illness and their experience on how it affects their life (Zazworsky & Carpenito-Moyet, 2007). Patients will be more likely to modify their behaviors if they believe they are susceptible to the severe consequences of not appropriately managing their diabetes (Simpson, 2015). The patient will alter their behaviors if the benefits outweigh the perceived barriers (Simpson, 2015). Diabetes self-management is only effective when patients learn to practice self-care with the confidence necessary to execute and maintain new behaviors. The results of this QI project showed that the patients gained self-confidence, and they also gained knowledge.

Implications (Practice, Education, Research and Policy)

The clinic's stakeholders received the results from this project with patients' information withheld. Stakeholders were happy with the improvement the patients made in their knowledge and self-efficacy scores. They were given the links to the videos to consider including them in the video loop that plays at the clinic inpatient rooms daily. They also discussed providing the patients with video links on flyers or business cards to watch at home. Another suggestion is that the medical assistants can start the videos after they bring the patients to their room, for them to view while they wait for the provider. Additionally, the videos transcripts can be merged into a podcast for patients to listen to at their convenience. Adjustments to the project for the clinic's use will be made on future cycles of PDSA and exceed the scope of this project. However, clinic stakeholders were interested in including DSME for their patients and will continue to discuss the implementation in the future. Clinic providers all agreed on one significant common barrier to providing DSME to their patients - limited time with patients. A common obstacle like this indicates the need for practice change to give practitioners the time needed.

Limitations

The limitations to the project include the small sample size. Although 16 patients were contacted and emailed the pretests and post-test along with the educational videos, only six patients completed both tests and watched both videos. The small sample size can impact the validity and reliability of the results, making them not generalizable. The results could have also been affected by the current COVID-19 pandemic. Infection rates in the area had recently spiked, and providers were seeing a limited number of patients in the office, so most patients were contacted over the phone. The inability to have a personal interaction with the patients limited

the sample size. The PI could not conduct the pre- and post-surveys in-office as anticipated. Participation was also voluntary, so these patients may be more interested than the general population in diabetes education, making the results skewed and not representative. Another limitation to the project, which may have affected validity, is that the posttest had the same questions as the pretest. Pretests and posttests like these can affect validity by allowing for test-retest score increases.

Additionally, the tests were self-reported, leading to overrepresentation by the test taker, skewing the results. These limitations will be discussed and reviewed for the next PDSA cycle. Another feature of QI projects is that they are tailored for specific locations, which was meaningful, adoptable, and purposeful to this site specifically. However, results obtained from this QI project can be evaluated by other clinics with the intention of the project being employed to achieve similar results.

DNP Essentials Addressed

This project addressed the following Doctor of Nursing Practice (DNP) Essentials: a) organizational and systems leadership for quality improvement, b) interprofessional collaboration for improving patient and population health, and c) clinical prevention and population health for improving the nation's health (American Association of Colleges of Nursing [AACN], 2020). Fulfillment of the DNP Essentials includes the PI showing a leadership role within the organization to develop and implement a QI project based on the organization's needs. The PI worked with the APRN and the DO of the primary care site to improve patient and population health by providing DSME focused on diet. This QI project can help patients with diabetes, prediabetes, or gestational diabetes avoid the health consequences associated with

inappropriately managed diabetes. Preventing diseases related to uncontrolled diabetes can reduce healthcare costs and improve population health.

Conclusions

Approximately 34.2 million people were diagnosed with DM in 2018 in the US (10.5% of the population) (CDC, 2020). Severe comorbidities are associated with inadequate management of this disease, and in 2017, DM was the seventh leading cause of death in the US (CDC, 2020). Over 83,000 deaths a year are attributed to DM, and other 270,702 death records list DM as a contributing cause of death (CDC, 2020). Approximately 7.3 million (2.8%) adults are estimated to have undiagnosed diabetes (CDC, 2020). The total associated costs of diagnosed DM are roughly \$327 billion, up from \$188 billion in 2012 (CDC, 2020). DSME focusing on nutrition as an evidence-based intervention has been shown to reduce mortality, secondary comorbidities, and associated costs for patients and providers (Sandouk & Lansang, 2017). Results from this QI project indicate that this educational intervention can increase knowledge and self-efficacy related to diabetes diet management. Improved expertise and self-efficacy lead to patients who have more self-confidence, less depression, and a sense of control over their disease (Turner et al., 2018). DM patients who attend DSME improve HgA1C on average 0.45-0.57%, reducing diabetes-related complications, mortality, and increased quality of life (Powers et al., 2020).

Plan for Sustainability

The stakeholders received the results of this QI project at the clinic. The project results were beneficial to the patients, and the clinic would like to incorporate the education somehow. They are currently deciding whether to integrate the teaching into their practice and how they

can accomplish this. For the next PDSA cycle, the clinic will have to determine how to deliver the education to the patients. The video links were provided to the clinic and are also available online for their use. The second cycle should include a more significant number of participants to evaluate the new delivery method.

Plan for Dissemination

An executive summary was developed and distributed to the QI project stakeholders on October 11, 2021 (Appendix I). The executive summary outlined the project's background, purpose, methods, results, and conclusions. The clinic received the links to both videos and the pretest and posttest survey as resources for sustainability purposes. The finalized DNP project will be submitted for professional publication and review for presentation at local conferences.

APPENDIX A:
SITE APPROVAL/THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD
APPROVAL LETTER

Midway Primary Care
3255 South US 1
Fort Pierce, FL 34982

July 13, 2021

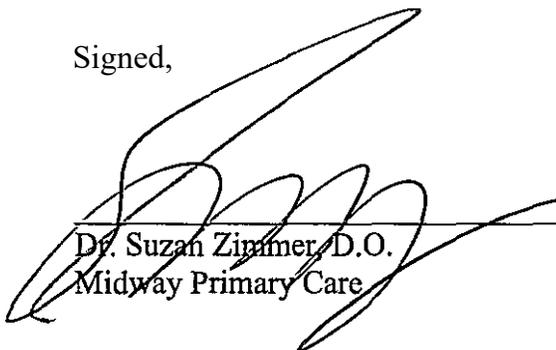
University of Arizona Institutional Review Board
c/o Office of Human Subjects
1618 E Helen St
Tucson, AZ
85721

Please note that Ms. Brooke Harper, UA Doctor of Nursing Practice student, has the permission of Midway Primary Care to conduct a quality improvement project at our facility for her project, A Diabetes Educational Intervention to Improve Self-Management.

Mrs. Harper will conduct surveys of Patients at Stuart Family Practice. She will recruit patients through contact at their appointments and via telephone and email. She will describe the project, what they will be asked to do, the time involved and links to the online survey. Ms. Harper's activities will be completed by September 25, 2021.

Mrs. Harper has agreed to provide a copy of the University, of Arizona Determination to my office before she recruits participants. She will also present aggregate results to the providers at their monthly staff meetings. If there are any questions, please contact my office.

Signed,



Dr. Suzan Zimmer, D.O.
Midway Primary Care

07/13/2021
Date



THE UNIVERSITY OF ARIZONA
**Research, Discovery
 & Innovation**

Human Subjects
 Protection Program

1618 E. Helen St.
 PO Box 245137
 Tucson, AZ 85724-5137
 Tel: (520) 626-6721
<http://rgw.arizona.edu/compliance/home>

Date: July 26, 2021

Principal Investigator: Brooke Elizabeth Harper

Protocol Number: 2107028656

Protocol Title: A DIABETES EDUCATIONAL INTERVENTION TO
 IMPROVE SELF-MANAGEMENT (A QUALITY
 IMPROVEMENT PROJECT IN A PRIMARY CARE
 CLINIC)

Determination: Human Subjects Review not Required

Documents Reviewed Concurrently:

Data Collection Tools: *7.12 Harper Educational Intervention.docx*

Data Collection Tools: *Pre.Post tests 7.12.docx*

HSPPP Forms/Correspondence: *Advisor Confirmation*

Email.pdf **HSPPP Forms/Correspondence:** *Harper B IRB*

3.7.13.pdf **Informed Consent/PHI Forms:** *Consent form*
7.13.docx

Other Approvals and Authorizations: *DSME Permission to*

Use.docx **Other Approvals and Authorizations:** *Signed Midway*

Site Permission.pdf **Recruitment Material:** *7.12 Harper*

recruitment.flyer.docx

Regulatory Determinations/Comments:

- Not Research as defined by 45 CFR 46.102(l): As presented, the activities described above do not meet the definition of research cited in the regulations issued by US Department of Health and Human Services which state that "Research means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes. For example, some demonstration and service programs may include research activities. For purposes of this part, the following activities are deemed not to be research."

The project listed above does not require oversight by the University of Arizona.

If the nature of the project changes, submit a new determination form to the Human Subjects Protection Program (HSPPP) for reassessment. Changes include addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature and broadening the scope or nature of the study activity. Please contact the HSPPP to consult on whether the proposed changes need further review.

The University of Arizona maintains a Federalwide Assurance with the Office for Human Research Protections (FWA #00004218).

APPENDIX B:
CONSENT DOCUMENT (DISCLOSURE FORM)

Disclosure Form

A Diabetes Educational Intervention to Improve Self-Management

You are being invited to participate in a research study conducted by Brooke Harper, a Doctor of Nursing Practice student enrolled at the University of Arizona. Please read the information below to understand the potential benefits and risks of participating in this project.

The purpose of this DNP quality improvement project is two-fold: To identify patient's knowledge baseline on Diabetes self-management and increase patient knowledge of a high protein, low carbohydrate diet to improve HgA1C, promote weight loss, and improve overall perceived quality of life.

If you choose to participate in this project, you will be asked to complete a pre- and post-survey before and after reviewing a brief video. Each survey is expected to take approximately 5 minutes to complete. **You will be asked to enter your email address when filling out the surveys for the principal investigator (PI) to send you a follow-up email with a link to the video and post-survey.** This will allow the PI to link pre- and post-survey results to the same participant for data analysis.

There are no foreseeable risks associated with participating in this study. Only the PI will have access to the survey responses. Representatives of regulatory agencies, such as the Office of Human Research Protections and the University of Arizona Human Subjects Protection Program, may access survey results to ensure proper project conduct. The Institutional Review Board at the University of Arizona has reviewed this project for compliance with state and federal regulations and university policies designed to protect the rights and welfare of project participants.

Participation is voluntary, and you may choose to withdraw at any time. Refusal to participate or withdraw from the study will involve no penalty or loss of benefits to which you are otherwise entitled. Also, you may skip any questions you choose not to answer. You do not give up any personal or legal rights you may have as a participant by participating.

For questions, concerns, or complaints about the project, you may contact the PI at beharper@email.arizona.edu. You may also contact the PI's advisor, Dr. Patricia Daly Ph.D., FNP-BC, ENP-BC, FAANP at pdaly@email.arizona.edu.

APPENDIX C:
RECRUITMENT MATERIAL (RECRUITMENT FLYER)

MIDWAY PRIMARY CARE

Do you Struggle with...DIABETES?

Learn what YOU can DO to MANAGE your health

- **Participate in a free educational program study conducted by Doctoral Candidate Brooke Harper, RN, BSN, CCRN**

The University of Arizona

Topics –

- Understanding the Disease
- Selecting healthy foods
- Planning healthy menus
- Staying active
- Dealing with stress
- Delaying complications
- Learning to communicate with your family and healthcare team
- Setting goals

For more information and to register:

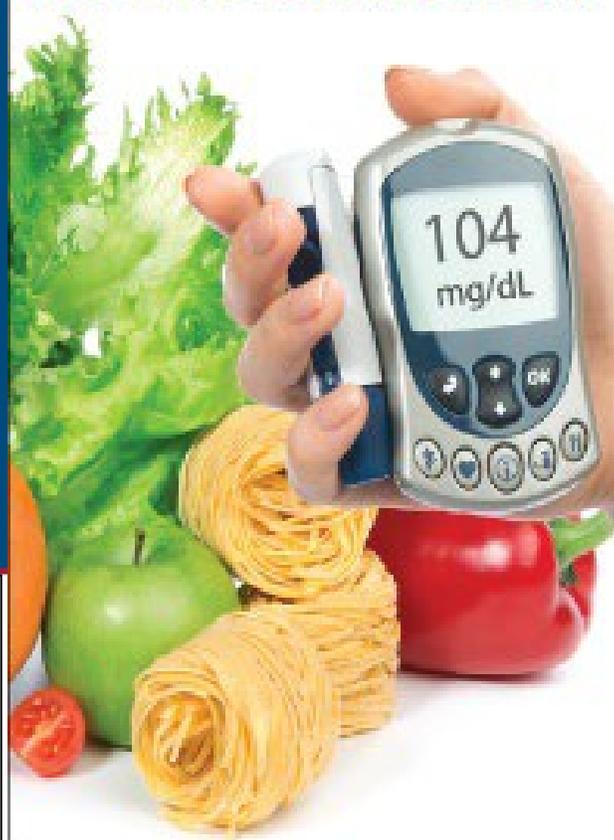
Tracy Britcher APRN-C
(772)742-9270

OR

Brooke Harper, RN, BSN, CCRN
(520)248-7605

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Nutrition Education for Diabetes Mellitus



APPENDIX D:
EVALUATION INSTRUMENTS (PRETEST AND POSTTEST SURVEYS)

Pretest

Four Digit ID _____

Please identify the following information:

Gender:

Male Female

Educational level:

High School Diploma GED Associates Bachelor's Post Bachelor's Education

Have you ever attended (virtual, online or in person) a diabetes self-management course?

Yes No

How many years have you had Diabetes?

0-2 3-5 6-8 9-11 12-14 15+

Questions on Knowledge and Attitudes

On a scale of 0-5, where 0 means "strongly disagree" and 5 means "strongly agree", please rate the following statements.

I feel discouraged by being diagnosed with Diabetes:

0 1 2 3 4 5

I feel fearful about my future health:

0 1 2 3 4 5

I want to do better with managing my diabetes by eating more protein:

0 1 2 3 4 5

I feel confident I can manage my diabetes through diet:

0 1 2 3 4 5

I feel confident that I can eat my meals every 4 to 5 hours every day:

0 1 2 3 4 5

I feel confident I can choose the appropriate foods to eat when I am hungry (for example, snacks):

0 1 2 3 4 5

I feel confident that I can control my diabetes so that it does not interfere with things I want to do:

0 1 2 3 4 5

I know what healthy carbohydrates are:

0 1 2 3 4 5

Proteins (like lean meat, chicken, and fish) affect my blood sugar minimally:

0 1 2 3 4 5

Fresh fish or frozen fish are a great way to incorporate protein into my diet:

0 1 2 3 4 5

Eating a diet high in produce and protein will help manage my blood sugar and A1C level:

0 1 2 3 4 5

Posttest

Four Digit ID _____

After completing the two videos on Diabetes self-management “Healthy Eating Through Diabetes” and “What is the Mediterranean Diet”, please answer the following questions:

On a scale of 0-5, where 0 means “strongly disagree” and 5 means “strongly agree”, please rate the following statements.

I feel discouraged by being diagnosed with Diabetes:

0 1 2 3 4 5

I feel fearful about my future health:

0 1 2 3 4 5

I want to do better with managing my diabetes by eating more protein:

0 1 2 3 4 5

I feel confident I can manage my diabetes through diet:

0 1 2 3 4 5

I feel confident that I can eat my meals every 4 to 5 hours every day:

0 1 2 3 4 5

I feel confident I can choose the appropriate foods to eat when I am hungry (for example, snacks):

0 1 2 3 4 5

I feel confident that I can control my diabetes so that it does not interfere with things I want to do:

0 1 2 3 4 5

I know what healthy carbohydrates are:

0 1 2 3 4 5

Proteins (like lean meat, chicken, and fish) affect my blood sugar minimally:

0 1 2 3 4 5

Fresh fish or frozen fish are a great way to incorporate protein into my diet:

0 1 2 3 4 5

Eating a diet high in produce and protein will help manage my blood sugar and A1C level:

0 1 2 3 4 5

APPENDIX E:
PARTICIPANT MATERIAL (LINKS AND TRANSCRIPTS FOR EDUCATIONAL VIDEOS)

First Educational Video: <https://www.diabetesselfmanagement.com/videos/healthy-eating-with-diabetes/>

Transcript

Healthy Eating with Diabetes

Hi, I'm Alison Massey, Registered Dietician, Certified Diabetes Educator and Contributor to Diabetes Self-Management Magazine.

What to Eat with Diabetes

When people are diagnosed with diabetes, one of the first questions they always ask themselves is "What can I eat now?". Making healthy changes to your diet to best manage your diabetes doesn't have to be difficult. And with a few simple tips, you'll be on your way to feeling confident about your food choices, regardless of if you're preparing a healthy meal at home or eating out.

Depending on its composition, food is typically divided into one of three nutrient categories. Carbohydrates, Protein or Fat. They are all important for a healthy diet and provide the body with the energy and fuel it needs. But you should be aware that these different types of nutrients do have different effects on blood glucose levels.

Carbohydrates and Diabetes

Carbohydrates are sugars and starches, and they include grains, pasta, rice, bread, fruit and fruit juices, vegetables, especially starchy vegetables including peas, potatoes, corn and beans, milk and yogurt and other dairy foods and any food with added sugar. These foods give our body energy and are broken down into glucose, a type of sugar that is released into the blood stream. Carbohydrates have the most impact on elevating your blood glucose levels. So, speaking with a

certified diabetes educator or a registered dietician about the right portions of carbohydrate foods to include in your meal plan is key.

How Does Protein and Fat Affect Blood Sugar

Now, let's talk about proteins and fats. They tend to affect blood glucose levels minimally and not contribute significantly to a rise in blood sugar. Protein foods help our body build and repair muscles and include items such as beef, turkey, chicken, fish, eggs and nuts and seeds. Fat, meanwhile, plays an important role in helping insulate our bodies. As well as helping us absorb fat soluble vitamins in keeping our skin and hair healthy. Fats include oils, butters, salad dressing, mayonnaise, and nuts. In each category of food, regardless of if its primarily carbohydrate, protein or fat, there are some better choices to include in your diet and others that are better to limit. With that in mind, lets break down the basics of creating a healthy meal or snack.

Diabetic Healthy Meal Plan

Step 1:

Focusing on filling one half of your plate with low-carbohydrate vegetables or starting your meal with a homemade vegetable soup. Not only are these foods packed with important vitamins and minerals, but they are low in carbohydrates and have a minimal effect on your blood glucose.

Step 2:

Choose healthy snacks to have between meals such as nuts or seeds, a small piece of fruit sliced vegetables with dip, instead of high-fat and high-carbohydrate options such as chips, crackers, candy and cookies.

Step 3:

Stay well hydrated with low-carbohydrate beverages such as water or unsweetened tea. And avoid your limit to sweet stuff including sodas, juices, lemonades, and sweet teas.

Step 4:

Lastly, eat smaller portions of carbohydrate foods. Learning the right amount of carbohydrates to include at your meals and snacks is key. Carbohydrate counting is a healthy skill for many people with diabetes. And your diabetes educator can help you how to count those carbs. At the end of the day, it all comes down to portion control.

Eating a healthy diet when you have diabetes doesn't need to be difficult when you keep healthy eating principles in mind. Check out DiabetesSelfManagement.com and subscribe to Diabetes Self-Management magazine for more tips and healthy recipes.

Second Educational Video: <https://www.diabetesselfmanagement.com/videos/what-is-the-mediterranean-diet/>

What is the Mediterranean Diet?

Hi, I'm Alison Massey, Registered Dietician, Certified Diabetes Educator and Contributor to Diabetes Self-Management Magazine.

People often ask, "What is the best dietary pattern to follow?"

Although diet should always be individualized to someone's specific health needs and lifestyle, there is one dietary pattern that has been widely researched and consistently is recommended as one of the best patterns for eating for cardiovascular health. And that's the Mediterranean meal pattern.

Because individuals with diabetes are at higher risk of cardiovascular disease, it is often a pattern of eating that I encourage my clients to learn more about.

What are the benefits of the Mediterranean Diet?

The Mediterranean meal pattern has been shown to lower blood pressure, improve cholesterol levels and reduce markers for blood vessel inflammation.

So, what is the Mediterranean meal pattern?

The Mediterranean meal pattern is generally high in fruits and vegetables, beans and lentils, nuts, whole grains, olive oil, garlic, and fish. It is low in red meat, dairy, as well as sweets and desserts.

Mediterranean Diet Tips

Here are my tips for switching your dietary habits to a Mediterranean-based meal pattern.

Tip #1 – Try to incorporate seafood at least two to three times a week. Fresh and frozen fish are

great options when they are available. But don't forget, can varieties of, also count.

Tip #2 – Increase beans and lentils to at least two to three times a week. Use beans to top salads or and beans and lentils to soups and stews.

Tip #3 – Add nuts and seeds to your diet at least three times a week. Add almonds, walnuts, hazelnuts and even peanuts. Don't forget a serving is about a quarter of a cup.

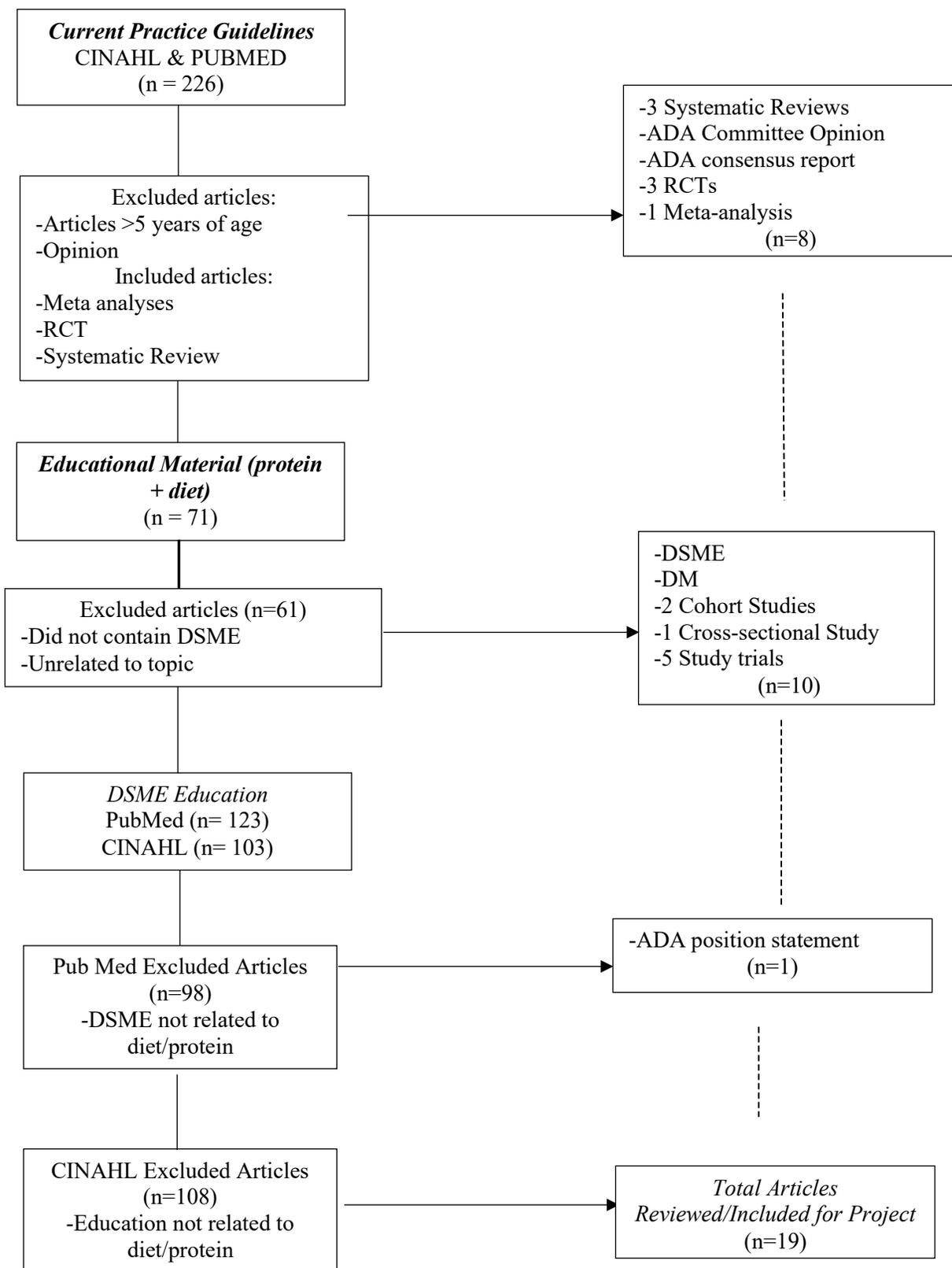
Tip #4 – Make produce the all star on your plate. Use the 50% rule. Try to make 50% of your meal produce based, either fruits, vegetables, or both to naturally increase your produce consumption.

Tip #5 – Cook with olive oil. Add more olive oil to your eating pattern by using it in cooking, as well as, making your own salad dressing

APPENDIX F:
PROJECT TIMELINE

Completion Date	Planning	Pre-Implementation	Implementation	Evaluation
May 1, 2021	Submit proposal to project chair			
May 10-May 22, 2021	Identify 3 rd chair member			
May 22-May 31, 2021		Solidify site, obtain authorization to use site		
June 6, 2021		Send proposal/methodology to committee chair		
June 13, 2021		Obtain proposal approval from committee chair		
July 9, 2021		Proposal Defense Presentation		
July 9-July 21, 2021	Make committee revisions to proposal			
July 21, 2021	Submit to College of Nursing Research Committee			
July 31, 2021		Make revisions from CON Research Committee		
August 24, 2021		Obtain IRB Approval		
August 24-September 25, 2021		Recruit participants at clinic site	Implement intervention at project site	Pretest and Posttest of educational sessions
September 28, 2021- October 11, 2021				Analyze Data
October 25-November 9, 2021				Final Defense Presentation of Project Results Executive Summary provided to Clinic Owner

APPENDIX G:
FLOW DIAGRAM OF LITERATURE SEARCH



APPENDIX H:
LITERATURE REVIEW GRID

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
2020, American Association of Diabetes, Educators	An effective model of diabetes care and education: revising the AADE7 self-care behaviors((R))	A revised position statement with updates in research and to refresh the AADE7 framework.	The American Association of Diabetes Educators (AADE) believes that the AADE7 is the framework for achieving behavior change leading to effective self-management through improved behavior outcome measures.	The AADE7 model guides person-centered collaboration and goal setting to achieve health-related outcomes and improved quality of life.
2020, American Diabetes, Association	Facilitating behavior change and well-being to improve health outcomes: standards of medical care in diabetes	A review of the ADA's current clinical practice recommendations intended to provide diabetes care, general treatment goals and guidelines, and tools to evaluate care quality.	Current clinical practice recommendations and guidelines regarding diabetes care, treatment goals, and tools to evaluate care quality.	ADA's clinical practice recommendations and standards of care.
2020, American Diabetes, Association	Classification and diagnosis of diabetes: standards of medical care in diabetes	A review of the ADA's current clinical practice recommendations to provide the components of diabetes care, general treatment goals and guidelines, and tools to evaluate the quality of care.	Current clinical practice recommendations and guidelines regarding diabetes care, diagnosis, treatment goals, and tools to evaluate care quality.	ADA's clinical practice recommendations and standards of care.
2020, Powers, M. A., Bardsley, J. K., Cypress, M., Funnell, M. M., Harms, D., Hess-Fischl, A., Hooks, B., Isaacs, D., Mandel, E. D., Maryniuk, M. D., Norton, A., Rinker, J., Siminerio, L. M., & Uelmen, S.	Diabetes self-management education and support in adults with type 2 diabetes: a consensus report of the American Diabetes Association, the Association of Diabetes Care & Education Specialists, the Academy of Nutrition and Dietetics, the	A position statement on diabetes self-management education with a summary of findings and examples.	This position statement focuses on patients with type 2 diabetes and the diabetes self-management education specific to improve their health and reduce health care costs associated with diabetes.	Examples of evidence-based diabetes self-management algorithms with rationale and explanation of benefits to the patients and the healthcare practice.

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
	American Academy of Family Physicians, the American Academy of PAs, the American Association of Nurse Practitioners, and the American Pharmacists Association			
2019, Evert, A. B., Dennison, M., Gardner, C. D., Garvey, W., Lau, K., MacLeod, J., Mitri, J., Pereira, R. F., Rawlings, K., Robinson., S, Saslow., L., Uelmen, S., Urbanski, P. B., & Yancy, W. S.	Nutrition therapy for adults with diabetes with diabetes or prediabetes: a consensus report	A consensus report on medical nutritional therapy for diabetic patients. Consensus recommendations and goals of nutrition therapy.	The American Diabetes Association (ADA) states that medical nutrition therapy (MNT), taking into consideration a patients cultural and religious preferences, is fundamental in diabetes management. MNT should be assessed by providers at diagnosis, a change in health status or life stage. With referral for DSME when needed and according to national standards.	A 12-week study comparing 30% vs. 15% energy from protein noted improvements in weight, fasting glucose, and insulin requirements in the group that consumed 30% energy from protein. A meta-analysis from 2013 of studies ranging from 4–24 weeks in duration reported that high-protein eating plans (25–32% of total energy vs. 15–20%) resulted in 2 kg greater weight loss and 0.5% greater improvement in A1C but no statistically significant improvements in fasting serum glucose, serum lipid profiles, or blood pressure.
2018, Adam, L., O'Connor, C., & Garcia, A. C.	Evaluating the impact of diabetes self-management education methods on knowledge, attitudes, and behaviours	A randomized controlled trial using pretest and posttest design. This study compared the effectiveness of 2 diabetes self-management education by examining changes in glycated hemoglobin (A1C) levels and	Significant differences in knowledge and attitude score changes were observed from baseline/initial education and after three months. Both groups had	Identifies the benefits of early education, the need for multiple lifestyle behavior changes, and social support feelings. The differences observed may lead to improved diabetes self-management, reducing costly

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
	of adult patients with type 2 diabetes mellitus	knowledge, attitudes, and behaviors after traditional group education or with diabetes conversation maps.	significant decreases in A1C levels from baseline to 3 months.	health complications related to poorly controlled diabetes.
2018, Azami, G., Soh, K. L., Sazlina, S. G., Salmiah, M. S., Aazami, S., Mozafari, M., & Taghinejad, H.	Effect of a nurse-led diabetes self-management education program on glycosylated hemoglobin among adults with type 2 diabetes	A two-arm parallel-group with blinded outcome assessors randomized controlled trial. This study investigated the effectiveness of a nurse-led diabetes self-management education on glycosylated hemoglobin.	Outcome measures were assessed at baseline and 12-week and 24-week intervals. Patients in the intervention group showed improvement in HbA1C, blood pressure, body weight, efficacy expectation, outcome expectation, and diabetes self-management behaviors.	The beneficial effect of a nurse-led intervention continued to accrue beyond the end of the trial. Nurses are more likely to promote preventive healthcare seeking behaviors.
2018, Wan, E. Y. F., Fung, C. S. C., Jiao F. F., Yu, E. Y. T., Chin, W. Y., Fong, D. Y. T., Wong, C. K. H., Chan, A. K. C., Chan, K. H. Y., Kwok, R. L. P., & Lam, C. L. K.	Five-year effectiveness of the multidisciplinary risk assessment and management programme – diabetes mellitus (RAMP-DM) on diabetes-related complications and health service uses—a population-based and propensity-matched cohort study	A population-based and propensity-matched cohort study- 26,718 RAMP-DM participants and 26,718 matched usual care patients for a median time of 4.5 years.	The cumulative incidence of all events (DM-related complications and all-cause mortality) was 23.2% in the RAMP-DM group and 43.6% in the usual care group. RAMP-DM led to significantly greater reductions in cardiovascular disease (CVD) risk by 56.6% (95% CI 54.5, 58.6), microvascular complications by 11.9% (95% CI 7.0, 16.6), mortality by 66.1% (95% CI 64.3, 67.9), specialist attendance by 35.0% (95% CI 33.6, 36.4), emergency attendance by 41.2% (95% CI 39.8, 42.5), and hospitalizations by 58.5% (95% CI 57.2, 59.7). Patients with low baseline CVD risks benefitted the most from RAMP-DM, which decreased CVD and mortality risk	Emphasizes the importance of diabetes control and risk factor management by protocol-driven, chronic disease care to prevent disease progression and complications.

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
			by 60.4% (95% CI 51.8, 67.5) and 83.6% (95% CI 79.3, 87.0).	
2018, Brouns, F.	Overweight and diabetes prevention: is a low-carbohydrate-high-fat diet recommendable?	Review- review highlights recent metabolic and clinical outcomes of studies and practical feasibility of low carb diets.	Diets that reduced intake will result in weight loss and metabolic and functional changes; short-term LCHF studies show both favorable and less desirable effects; adherence to a ketogenic diet can be difficult. 150g of carbs or less per day might be more practical.	Supports low carb, high protein diets for DM patients for weight loss, and A1C goals. Contrasting opinion - low carb diets contribute to high-fat diets, which may affect overall health negatively.
2018, Turner, R. M., Ma, Q., Lorig, K., Greenburg, J., DeVries, A.	Evaluation of a diabetes self-management program: claims analysis on comorbid illnesses, health care utilization, and cost	Two-group, pre-/post-design, comparing the impact of the Better Choices Better Health Diabetes (BCBH-D) self-management program on comorbidities related to DM, health care utilization and health care costs.	The self-management cohort of 1669 patients experienced a decrease in ER visits, outpatient visits, and a decrease in costs of healthcare by approximately \$815.	
2018, Turner., R. M., Ma, Q., Lorig, K., Greenburg, J., & DeVries, A. R.	Evaluation of a self-management program: claims analysis on comorbid illness, healthcare utilization and cost	A propensity score matched two-group; pre-/post-design was used for this study. Retrospective administrative medical and pharmacy claims data from the Health Core Integrated Research Environment were used for outcome variables The aim of this study was to evaluate the impact of the Better Choices Better Health Diabetes (BCBH-D) self-management program on comorbid illness related to	The self-management cohort experienced reductions for diabetes associated comorbid conditions, with the postintervention disease burden being significantly lower (mean 1.6 [SD 1.6]) compared with the control cohort (mean 2.1 [SD 1.7]; $P=.001$). Postintervention all-cause utilization was decreased in the intervention cohort compared with controls with -40/1000 emergency department visits vs +70/1000; $P=.004$ and -5780 outpatient visits per 1000 vs	DSME showed large and significant reductions in all-cause utilization and costs for the intervention cohort for inpatient, ED, and outpatient services, as well as total all-cause medical and pharmacy costs. There was reduced utilization for chronic conditions that often co-occur with DM. There were fewer claims for hypertension, hyperlipidemia, and depression among participants in the intervention cohort, whereas the matched

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
		diabetes mellitus, health care utilization, and cost.	-290/1000; $P=.001$. Unadjusted total all-cause medical cost was decreased by US \$2207 in the intervention cohort compared with a US \$338 decrease in the controls; $P=.001$.	control cohort showed significant increases in claims for health care services associated with renal disease, ischemic heart disease, osteoporosis, and musculoskeletal disorders compared with the intervention cohort.
2017, Baraz, S., Zarea, K., & Shahbazian, H. B.	Impact of the self-care education program on quality of life in patients with type II diabetes	Pretest/posttest intervention study design with 30 non-randomized diabetes patients.	There was a significant increase in general health ($P=0.027$), physical role ($P<0.001$), physical functioning ($P=0.027$), social functioning ($P=0.029$), and body pain ($P=0.020$).	Education improves the patient's perception of their health after the teaching program.
2017, Miki, A., Hashimoto, Y., Matsumoto, S., Ushigome, E., Fukuda, T., Sennmaru, T., Tanaka, M., Yamazaki, M., & Fukui, M.	Protein intake, especially vegetable protein intake, is associated with higher skeletal muscle mass in elderly patients with type 2 diabetes	Cross-sectional study- analyzed the association between dietary protein intake and muscle mass in elderly diabetic patients.	Protein intake was correlated with muscle mass increase (standardized regression coefficient = 0.664, $P < 0.001$ in men and standardized regression coefficient = 0.516, $P = 0.005$ in women). Animal protein to vegetable protein ratio was negatively correlated with increased muscle mass after (standardized regression coefficient = -0.339, $P = 0.005$).	Vegetable protein intake was positively associated with muscle mass in elderly patients with type 2 diabetes.
2017, Sato, J., Kanazawa, A., Hatae, C., Makita, S., Komiya, K., Shimizu, T., Ikeda, F., Tamura, Y.,	One-year follow-up after a randomized controlled trial of a 130 g/day low-carbohydrate diet in patients with type 2	Randomized controlled trial follow-up- initial trial showed that a 6-month 130g/day low-carbohydrate diet Reduced HbA1C and BMI more than a calorie-restricted diet. One year	One year later, the beneficial effect of a low carb diet on reducing HbA1C and BMI did not continue.	Nutrition therapy programs were equally effective in improving HbA1C for at least one year.

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
Ogihara, T., Mita, T., Goto, H., Uchida, T., Miyatsuka, T., Ohmura, C., Watanabe, T., Kobayashi, K., Miura, Y., Iwaoka, M., Hirashima, N., & Watada, H.	diabetes mellitus and poor glycemic control	later, they compared HbA1C and BMI between the LCD and CRD groups at one year after the end of the 6-month RCT.		
2016, Chrvala, C. A., Sherr, D., & Lipman, R. D.	Diabetes self-management education for adults with type 2 diabetes mellitus: a systematic review of the effect on glycemic control	A systematic review to assess the effect of diabetes self-management education on glycemic control in adults with type 2 diabetes	In 118 studies, 61.9% reported significant changes in A1C. The overall mean reduction in A1C was 0.74 and 0.17 for intervention and control groups, an average absolute reduction in A1C of 0.57. Contact hours ≥ 10 was associated with a greater proportion of interventions with a significant decrease in A1C (70.3%).	Diabetes self-management education results in a statistically significant decrease in A1C levels. The type of education provided, the hours of engagement, and baseline A1C can affect the likelihood of achieving statistically significant and meaningful improvement in A1C.
2016, Kim, S. H. & Lee, A.	Health-literacy-sensitive diabetes self-management interventions: a systematic review and meta-analysis	A systematic review and meta-analysis- a focus on identifying strategies for accommodating patients with low health literacy and examining these interventions' efficacy to improve health outcomes.	Health-literacy-sensitive diabetes management interventions were effective in reducing HbA1C level in the meta-analysis	The intervention should use strategies for accommodating people with low health literacy in diabetes self-management. The use of verbal communication provides the best outcomes in diabetes self-management.
2016, Rav-Marathe, K., Wan, T., & Marathe, S.	A systematic review on the Kap-O framework for diabetes education and research	Systematic review- formulates an appropriate framework, specifies the relationships among knowledge, attitude, practice, and outcomes (KAP-O), and examines the factors	The purpose of this scientific review is to identify the underlying causal mechanisms responsible for improved knowledge, attitude, preventive practice, and outcomes so that educational interventions	It contains a review of Health behavioral theories were. Relevant studies on the knowledge, attitude, practice, and health care outcomes

Pub. Year; Author's Last Name	Title of Publication	Type of Study	Main Outcomes of Findings	Support for and or Link to Project
		influencing variations in the glycated hemoglobin (A1C), low-density lipoprotein cholesterol (LDLC), functional capacity (FC), and poor perceived health (PPH).	are tailored efficiently and effectively to patients who are most likely to benefit from self-care management. The review will examine multiple causes	reviewed to support a theoretical framework.
2016, Comerford, K. B. & Pasin, G.	Emerging evidence for the importance of dietary protein source on glucoregulatory markers and type 2 diabetes: different effects of dairy, meat, fish, egg, and plant protein foods	A review on the source of dietary protein and the management of T2DM.	A higher intake of dairy products (milk, yogurt, cheese, and whey protein) shows a beneficial relationship with glucose regulation. Dairy proteins have more potent effects on insulin and incretin secretion compared to other animal proteins.	It is supporting evidence for increased protein in the diet of DM patients. Particularly dairy products.
2015, Mattos, C. B., Viana, L. V., Paula, T. P., Sarmiento, R. A., Almeida, J. C., Gross, J. L., & Azevedo, M. J.	Increased protein intake is associated with uncontrolled blood pressure by 24-hour ambulatory blood pressure monitoring in patients with type 2 diabetes	Cross-sectional study - analyzed associations protein intake with blood pressure in patients with type 2 diabetes	The uncontrolled BP group had higher HbA1C values (8.4 ± 2.0 vs $7.6 \pm 1.3\%$; $p = 0.04$) and ate more protein (20.0 ± 3.8 vs $18.2 \pm 3.6\%$ of energy; $p = 0.01$) and meat, (2.6 [1.45, 2.95] vs 2.0 [1.49, 2.90] g/kg weight; $p = 0.04$) than the controlled group. Protein intake (% of energy) increased the chance for uncontrolled BP (odds ratio [OR] = 1.16; 95%	High protein intake was associated with elevated BP values in patients with type 2 diabetes. Reducing meat intake may be an intervention in patients with type 2 diabetes that have high BP.

APPENDIX I:
OTHER DOCUMENTS AS APPLICABLE TO THE PROJECT (PERMISSION FOR VIDEO
USE AND EXECUTIVE SUMMARY)

Hi Brooke,

Thank you for sending over your request.

Providing links to the article is allowed and no licensing is required to do so as long as no quotes from the article are used, and the Diabetes Self-Management masthead is not used.

Let me know if you have any additional questions.

Kind regards,

Aaron Deyang | Licensing & Content Manager

Wright's Media

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Office: 281-419-5725 x124

Toll: 877-652-5295



Good morning.

My name is Brooke Harper, and I am a Doctoral Candidate for the University of Arizona Family Nurse Practitioner program. My DNP Project is focused on Diabetes Self-management Education, with a focus on a healthy diet.

I would like to ask permission to provide the patients involved in my project the links to the videos on the website "Diabetes Self-Management"? I would be using two videos in the educational videos section:

Healthy Eating with Diabetes

What is the Mediterranean Diet?

If you were so kind as to allow me to use these videos for educational purposes in my DNP project, I would be most appreciative.

Thank you for your consideration.

Brooke Harper RN, BSN, CCRN
University of Arizona College of Nursing
DNP II/FNP Fall 2018 Cohort
beharper@email.arizona.edu
(520) 248-7605

10/11/2021

Midway Primary Care
3255 South US 1
Fort Pierce, FL 34982

Dear Midway Primary Care, Dr. Susan Zimmer, and APRN Tracy Britcher,

Thank you for allowing my DNP project, A Diabetes Educational Intervention to Improve Self-Management, to be distributed to the patients that you serve. I have provided an executive summary of the project's findings for your review, along with suggestions for sustainability:

Background

34.2 million people were diagnosed with DM in 2018 in the US, and severe comorbidities are associated with inadequate management. In 2017, DM was the seventh leading cause of death in the US. DSME focusing on nutrition as an evidence-based intervention has been shown to reduce mortality, secondary comorbidities, and associated costs for patients and providers. Patients who attend DSME have an improvement in HgA1C on average 0.45-0.57%, with reduced complications, mortality, and increased quality of life

Purpose

This quality improvement project was developed and implemented to increase knowledge and self-efficacy related to diabetes self-management, focusing on diet for diabetic patients at Midway Primary Care.

Methods

Patients treated at Midway Primary Care over 18 with diabetes were recruited for participation in this quality improvement project. Videos were provided to participants from Diabetes Education on self-management through healthy eating. Demographic data was collected prior to patients beginning the education. Before and after the intervention, diabetes knowledge and perceptions of self-efficacy were assessed via survey data in a pre/posttest manner.

Results

Six patients completed pretest and posttest surveys. The Wilcoxon-signed rank test with a p-value set at 0.05 for statistical significance was used to measure the change in knowledge and confidence. The results showed a statistically significant difference with $p=00008$. After the intervention, almost all patients (83%) reported they "strongly agree" they can manage their diabetes through diet.

Conclusions

The participants in the intervention increased their knowledge and self-efficacy in diabetes self-management through diet, from pretest to posttest.

Resources for Sustainability

1. Pre-recorded link: <https://www.diabetesselfmanagement.com/videos/healthy-eating-with-diabetes/>
2. Pre-recorded link: <https://www.diabetesselfmanagement.com/videos/what-is-the-mediterranean-diet/>
3. Pretest/Posttest link: https://docs.google.com/document/d/e/2PACX-1vRvyyWb6NgbtYCoA6ZMMEOFV6qjLrbOISaAADZo-k_fugY6qgo111qgiryv9Xc48S16Qfln0DXrqnk/pub

Please do not hesitate to contact me with any questions or comments.

Gratefully,

Brooke Harper, BSN, RN, DNP-FNP student
University of Arizona College of Nursing
Phone: (520) 248-7605
Email: beharper@email.arizona.edu

REFERENCES

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