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**A Novel Approach to Diabetes Prevention:
Implementation of a Multimedia-Based Diabetes
Prevention Program**

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A Novel Approach to Diabetes Prevention: Implementation of a Multimedia-Based Diabetes Prevention Program

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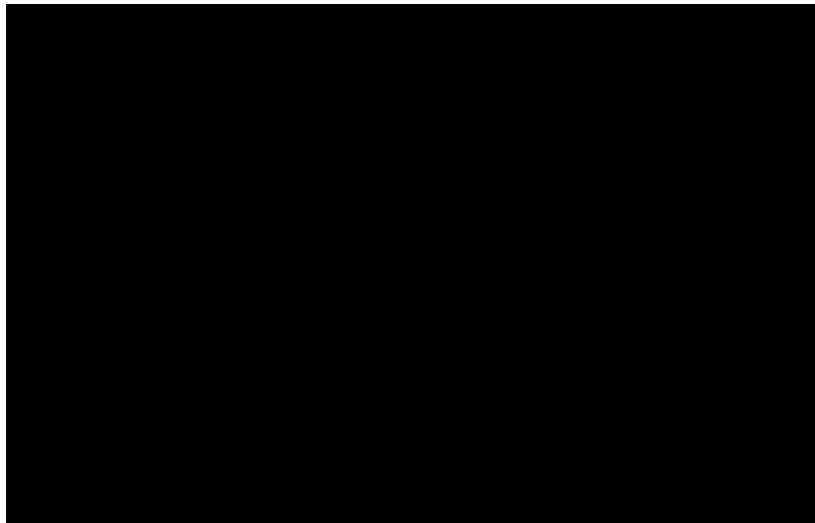
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By

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A Novel Approach to Diabetes Prevention:
Implementation of a Multimedia-Based Diabetes Prevention Program

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Table of Contents

Abstract.....	4
Introduction.....	5
Background and Significance.....	6
Global Health Policy.....	8
National Health Policy	9
Economic Impact.....	10
Current Practice.....	11
Needs Assessment.....	12
Problem Statement.....	15
Aims and Objectives.....	16
Review of Literature.....	17
Search Strategy.....	17
Diabetes Prevention Program prevents Type 2 Diabetes Mellitus.....	17
The Effectiveness of a Multimedia based Diabetes Prevention Program.....	20
Utilization of the Diabetes Prevention Program in Primary Care.....	21
Inconsistencies.....	22
Theoretical Model /Framework	23
Methodology.....	25
Setting.....	26
Study Population.....	26
Subject Recruitment.....	27
Consent Procedures.....	27

Risk/Harm/Ethics.....	28
Subject Costs and Compensation.....	28
Intervention Design and Resources	28
Sources of Data.....	31
Outcome Measures.....	31
Project Timeline.....	32
Project Budget.....	32
Evaluation Plan.....	33
Data Analysis.....	33
Data Maintenance and Security.....	34
Discussion.....	35
Implications.....	37
Plans for Sustainability and Translation.....	37
Professional Reporting and Future Scholarship.....	38
Summary.....	38
References.....	40
Appendices.....	45

Abstract

More than one in three Adults are diagnosed with Prediabetes in the United States (U.S.) (Centers for Disease Control and Prevention [CDC], 2018). People diagnosed with prediabetes are at high risk for developing type 2 diabetes mellitus, heart disease, stroke, and other cardiovascular risk factors such as hypertension and hyperlipidemia. Type 2 Diabetes Mellitus is considered a global epidemic and was reported as the seventh leading cause of death in the U.S. in 2015 (CDC, 2018). Prediabetes can be reversed by implementing lifestyle changes such as eating a healthy diet, increasing physical activity, and losing weight (CDC, 2018; Watson, 2017). Lifestyle modification is the gold standard of treatment to delay the progression of prediabetes and prevent type 2 diabetes mellitus (ADA, 2018; CDC, 2018; Watson, 2017). Through discussions with key stakeholders, patients, and research, this gap of care was revealed for patients who are diagnosed with prediabetes. Implementing a multimedia-based diabetes prevention program (DPP), to educate about lifestyle modifications (diet, exercise, weight loss), can reduce the progression of prediabetes and lead to the prevention of type 2 diabetes mellitus (CDC, 2018; Watson, 2017). The proposed DNP pilot project used a quasi-experimental quantitative design. This project included a purposeful sample of men and women in central New Jersey from an internal medicine practice that were diagnosed with prediabetes. The purpose of this quality improvement project was to determine whether a multimedia-based diabetes prevention program reverses or reduces the progression of prediabetes and prevents type 2 diabetes mellitus. A goal was for this multimedia-based diabetes prevention program to become part of the standard of care in the primary care setting.

Keywords: prediabetes, Diabetes Prevention Program, diabetes prevention, effectiveness, primary care, education video

Introduction

The Centers for Disease Control and Prevention (CDC) reported 84.1 million adults have prediabetes and 70% of those people will ultimately see their condition progress to type 2 diabetes mellitus if lifestyle modifications to improve their health are not implemented (Centers for Disease Control and Prevention [CDC], 2018; Kandula, Moran, Tang, and O'Brien, 2017). The CDC (2018) defines the serious health condition known as prediabetes is when your blood sugar levels are higher than normal but not high enough to be diagnosed as type 2 diabetes mellitus. Prediabetes is caused when the hormone made in the pancreas called insulin which acts like a key to allow blood sugar (glucose) into the body's cells and can be used for energy (CDC, 2018). In prediabetes the body's cells do not respond normally to insulin causing the pancreas to increase the production of insulin in an attempt to make the cells respond to insulin (CDC, 2018). The pancreas cannot continue producing insulin at this higher rate and eventually decreases the production of insulin or the cells become more and more resistant to insulin's action causing blood glucose to rise which in most cases causes prediabetes (CDC, 2018). The difficult part about prediabetes is that there are no clear signs and symptoms of the condition and it can go undiagnosed for years or until the condition progresses to type 2 diabetes mellitus (CDC, 2018; Watson, 2017). People who are diagnosed with prediabetes are at high risk for developing type 2 diabetes mellitus, heart disease, stroke, and associated cardiovascular risk factors such as hypertension and hyperlipidemia (CDC, 2018; Siu, 2015).

According to the United States (U.S.) Preventative Services Task Force (USPSTF), the current practice in primary care is to screen for prediabetes and type 2 diabetes mellitus every 3 years with an impending referral to intensive lifestyle intervention (ILI) which promotes physical activity and healthy diet for those who screen positive for prediabetes (Kandula et al., 2017; Siu,

2015). Screening for prediabetes and type 2 diabetes mellitus is completed with a simple blood test called the Hemoglobin A1C (HbA1c) which measures the average blood glucose levels over the past 3 months (CDC, 2018; Watson, 2017). According to the CDC, a normal HbA1c level is below 5.7% and a positive screening for prediabetes is a HbA1c level of 5.7% to 6.4% and a level higher than 6.5% indicates type 2 diabetes mellitus (CDC, 2018).

Despite evidence supporting ILI, the recommended treatment of patients with prediabetes is not done in current practice (Kandula et al., 2017). The high percentage of prediabetics whose condition progressed to type 2 diabetes mellitus indicates the recommended current practice is not effective demanding a change in practice (CDC, 2018; Kandula et al., 2017). Implementing a multimedia-based diabetes prevention (DPP), to educate about lifestyle modifications, reduces the progression of prediabetes and lead to the prevention of type 2 diabetes mellitus (CDC, 2018; Watson, 2017). Educating patients and helping them understand what prediabetes is, how to eat healthy, and the importance of aerobic exercise can dramatically improve their health and prevent the progression to type 2 diabetes mellitus (CDC, 2018; Watson, 2017). With education, support, and a positive attitude, patients are able to reverse their prediabetes, prevent type 2 diabetes mellitus, and live a long and healthy life.

Background and Significance

The CDC reported in 2015 that one in three adults who are aged 18 years or older in the U.S. have prediabetes which accounts for 84.1 million adults and nine out of ten people with prediabetes do not know they have the condition (CDC, 2018). Approximately 33.9% of U.S. adults 18 years of age or older and 48.3% (nearly half) of adults 65 years of age or older were diagnosed with prediabetes in 2015 (CDC, 2018). Prediabetes is associated with a 10% to 40% increased risk for stroke, cardiovascular disease, microvascular disease (Bergman et al., 2012).

Some risk factors of prediabetes are being age 45 years or older, family history of type 2 diabetes mellitus, having polycystic ovary syndrome, ever being diagnosed with gestational diabetes or giving birth to a baby weighing 9 pounds or more (CDC, 2018; Watson, 2017). Increase risk for prediabetes is linked to the African American, Hispanic, Latino American, American Indian, Pacific Islander, and Asian American ethnicities (CDC, 2018; Watson, 2017). Modifiable risk factors for prediabetes also include being overweight, having a high percentage of abdominal fat, or being obese, physical inactivity, and smoking (CDC, 2018; Watson, 2017). Women accounted for an estimated 29.3% of adults diagnosed with prediabetes in 2015 (“National Diabetes Statistics Report”, 2017). Men accounted for an estimated 36.6% of adults diagnosed with prediabetes in 2015 (“National Diabetes Statistics Report”, 2017).

The National Diabetes Statistic Report (2017) reported that 16.0% of adults diagnosed with prediabetes were Asian, 17.7% of adults were African American, 16.4% of adults were Hispanic, and 9.3% were Caucasian. The percentage of adults who were diagnosed with prediabetes who had less than a high school degree was 15.5%, with a high school degree accounted for 13.5%, and adults who had more than a high school degree accounted for 9.6% (“National Diabetes Statistics Report”, 2017).

The CDC reported that in the state of New Jersey, there are approximately 862,000 people or 11.3% of the adult population have type 2 diabetes mellitus and approximately 39,000 people are diagnosed with type 2 diabetes mellitus yearly (CDC, 2018). The CDC reported that approximately 235,000 people have type 2 diabetes mellitus and are not aware of their diagnosis increasing their risk for heart disease, stroke, and kidney disease (CDC, 2018). Furthermore, 2,483,000 people or 37.1% of the adult population have prediabetes (CDC, 2018). People who

are diagnosed with prediabetes are at high risk for developing type 2 diabetes mellitus, heart disease, and stroke (CDC, 2018; Siu, 2015).

The number of people diagnosed with type 2 diabetes mellitus have tripled in the last 20 years accumulating to more than 30 million adults who have type 2 diabetes mellitus in the U.S. subsequently increasing their risk for heart attack, stroke, kidney failure, blindness, and amputation of the lower extremities, toes, and feet (CDC, 2018; USDHHS, 2014). According to the U. S. Department of Health and Human Services (USDHHS, 2014) the prevalence rates of type 2 diabetes mellitus among American Indians are 2 to 5 times higher than Caucasians. African American adults are 1.7 times more likely to have type 2 diabetes mellitus and Puerto Ricans and Mexican Americans are twice as likely to be diagnosed with type 2 diabetes mellitus than Caucasians of similar age (USDHHS, 2014). In 2015, the CDC reported that Diabetes was the seventh leading cause of death in the U.S. and there were 79,535 deaths in which diabetes was listed as the underlying cause of death and 252,806 deaths in which diabetes was listed as any cause of death (CDC, 2018). These mortality numbers are alarming and they should prompt change. This increase in prediabetes is caused by being overweight or obese, poor diet, and physical inactivity that are very common in adults in the U.S. (CDC, 2018; Watson, 2017). The reversal of prediabetes and prevention of type 2 diabetes mellitus can occur by eating a healthy diet, being more physically active, and losing weight (CDC, 2018; Watson, 2017).

Global Health Policy

Type 2 diabetes mellitus is considered a global epidemic with approximately 285 million people, 6.4% of the global adult population, are diagnosed with type 2 diabetes mellitus (Bergman et al., 2012; Zimmet, 2017). Bergman et al. (2012) projected that by the year 2030 type 2 diabetes mellitus is estimated to reach 552 million according to the International Diabetes

Federation. Approximately 70% of the people diagnosed with type 2 diabetes mellitus occurs in low- and middle-income countries (LMIC) consequently from a poor diet consisting of high caloric foods and physical inactivity (Bergman et al., 2012). The World Health Organization (WHO) proposes more research towards diabetes prevention focusing on community based primary prevention models. These community based primary prevention models focus on how physical activity, nutrition, transportation, and urbanization can prevent type 2 diabetes mellitus (Bergman et al., 2012). According to Bergman et al. (2012) the International Diabetes Federation has been prominent in developing the overall framework for improving health outcomes for people diagnosed with diabetes. The International Diabetes Federation has been focused on reorienting health systems to a diabetes preventative model. The diabetes prevention model addresses health in all policies such as urban, workplace design, housing, food production, healthy nutrition and physical activity (Bergman et al., 2012). The International Diabetes Federation and the United Nations (UN) express the need for governments to set policies that promote healthy agricultural and nutritional policies, promote prevention models that encourage physical activity and healthy nutrition that is affordable for all citizens (Bergman et al., 2012). Lifestyle modification has been seen to be an effective treatment in reducing the progression of prediabetes to diabetes in studies conducted across diverse cultures globally (Bergman et al., 2012).

National Health Policy

One of the Healthy People 2020 objectives is to reduce the disease burden of type 2 diabetes mellitus, improve the quality of life for all people who are at risk for type 2 diabetes mellitus or who currently have type 2 diabetes mellitus (USDHHS, 2014). The continual rise of type 2 diabetes mellitus in the U.S. and globally is alarming and causes great concern for the

nation. There is concern that with the increase in the incidence of type 2 diabetes mellitus there will be an increase in the prevalence of diabetes related complications, and the complexity of care could overwhelm the health care systems (USDHHS, 2014). There are four “transition points” in the Healthy People 2020 objective to reduce the economic and health burden of type 2 diabetes mellitus. The four transition points are: primary prevention, testing and early diagnosis, access to care for all people diagnosed with type 2 diabetes mellitus and, improvement in quality of care (USDHHS, 2014). The barriers in the progression of diabetes care are the systems problems due to the design of health care systems, and the increased incidence of type 2 diabetes mellitus which may result in a decrease in available resources to treat each individual diagnosed with type 2 diabetes mellitus (USDHHS, 2014). The Diabetes Prevention Program research trial determined that lifestyle change is proven effective in preventing or delaying the onset of type 2 diabetes mellitus, had the greatest impact in older adults and, was also effective in all racial and ethnic groups (USDHHS, 2014). Transitional studies of the DPP has shown that delivery of the DPP intervention in group settings at the community level are also effective at reducing type 2 diabetes mellitus risk prompting the DPP to be implemented nationwide (USDHHS, 2014).

Economic Impact

Diabetes has a massive economic impact on millions of individuals, their families, and the health care systems in the U.S (CDC, 2018; Petersen, 2018). The CDC (2018) reported that in 2017 the total estimated cost of diabetes was \$327 billion, comprising \$90 billion in reduced productivity and \$237 billion in direct medical costs. Approximately one in four health care dollars is spent on people diagnosed with diabetes accumulating to \$16,750. This is approximately 2.3 times higher than people not diagnosed with diabetes (CDC, 2018). The indirect costs that were incurred by people diagnosed with diabetes are comprised of \$3.3 billion

due to increased absenteeism, \$26.9 billion due to reduced productivity while at work for the employed population and \$2.3 billion for those not in the labor force (Petersen, 2018). The cost due to the inability to work because of disease-related disability accounts for \$37.5 billion (Petersen, 2018). The societal loss of productivity is due to 277,000 premature deaths attributed to diabetes estimating \$19.9 billion in costs (Petersen, 2018). The CDC (2018) reported in 2017 that the direct medical expenses for people diagnosed with diabetes in New Jersey was estimated to be \$6.7 billion and an additional \$2.5 billion was spent on indirect costs as a result of reduced productivity due to diabetes. These statistics emphasize the significant financial burden that diabetes inflicts on society. Furthermore, the intangible costs imposed on society are from the resources used to provide care by nonpaid caregivers, pain and suffering, and the associated costs for people undiagnosed with diabetes (Petersen, 2018). The reversal of prediabetes and the prevention of type 2 diabetes mellitus will save lives, decrease costs to the economy, and reduce the risk of complications from type 2 diabetes mellitus such as heart disease, stroke, blindness, kidney failure, and loss of limb, toes, and feet (CDC, 2018; Petersen, 2018; Sui, 2015; Watson, 2017).

Current Practice

Evidence-based guidelines differ from source to source; however, the majority of sources recommend screening for all adults who are overweight, over the age of 40, live a sedentary lifestyle, and have at least one risk factor for type 2 diabetes mellitus (Watson, 2017). The screening recommendations from the American Diabetes Association (ADA) are to screen all adults beginning at the age of 45 or younger adults who are overweight, obese, and with at least one additional risk factor mentioned previously (ADA, 2018; Watson, 2017). According to the U.S. Preventative Services Task Force (USPSTF), the current practice for primary care settings

is to screen for prediabetes and type 2 diabetes mellitus every 3 years with an impending referral to intensive lifestyle intervention (ILI) which promotes physical activity and healthy diet for those who are positive for prediabetes during screening (Kandula, Moran, Tang, & O'Brien, 2017; Siu, 2015). The guidelines of the American Academy of Clinical Endocrinologists recommend screening all adults above the age of 45 and younger with any risk factors regardless of age every 3 years (Watson, 2017). Screening provides awareness to the patient of the condition of prediabetes but screening does not treat prediabetes (Watson, 2017). The ADA, CDC, and USPSTF all concur that lifestyle modification is the gold standard of treatment to delay the progression of prediabetes and prevent type 2 diabetes mellitus (ADA, 2018; CDC, 2018; Watson, 2017). The Diabetes Prevention Program (DPP) founded by the CDC has reported that with lifestyle modifications and a weight reduction of 5% to 7% of body weight, which could be as little as 10 to 14 pounds for a 200-pound adult, can cut the risk of developing type 2 diabetes mellitus in half (CDC, 2018; Watson, 2017). Kandula et al. (2017) reported that a structured intensive lifestyle intervention (ILI) can reduce type 2 diabetes mellitus by as much as 58%. This project supports the reversal of prediabetes and prevention of type 2 diabetes mellitus by teaching prediabetics about eating a healthy diet, being more physically active, and losing weight.

Needs Assessment

The continual rise of type 2 diabetes mellitus in the U.S. and globally is alarming and causing great concern around the world prompting change in policy to promote healthy nutrition, encourage physically active lifestyles and focus on health prevention. Approximately 350 million adult ambulatory care visits are made annually and screening tests are commonly performed in the primary care setting (Kandula et al., 2017). According to the USPSTF, the

current practice for primary care settings is to screen for prediabetes and diabetes every three years with an impending referral to intensive lifestyle intervention (ILI) which promotes physical activity and healthy diet for those who screen positive for prediabetes (Kandula et al., 2017; Siu, 2015). Research suggests that patients with prediabetes are infrequently counseled about lifestyle modification by their primary care providers (PCPs) and the rate of referral to evidenced-based ILI is not known (Kandula et al., 2017; Siu, 2015). This information reveals a significant gap between the evidence-based treatments to delay the progression of prediabetes and prevent type 2 diabetes mellitus and the PCPs current practice.

Through discussions with key stakeholders, patients, and research, this gap in care was revealed for patients who are diagnosed with prediabetes. The common practice by PCPs for patients who are diagnosed with prediabetes is a brief discussion on eating healthy and increasing exercise in an effort to lose weight leaving the patient feeling overwhelmed and not actually understanding the importance of lifestyle modification to prevent the progression of prediabetes and prevent type 2 diabetes mellitus (Kandula et al., 2017). At a busy solo internal medicine practice in central New Jersey many factors contributed to this common practice. Lack of time during appointments, lack of educational materials about the treatment of prediabetes and prevention of diabetes, lack of resources to refer patients to a Diabetes Prevention Program, patient motivation, and cost of the program were barriers discovered for this organization (Kandula et al., 2017). According to Kandula et al. (2017) the common barriers for PCPs providing diabetes prevention education and referring patients to a lifestyle modification Diabetes Prevention Program were competing demands during the clinical visit and the PCP's interpretation of evidence. Additional barriers were the patients' comorbidities and the patients' ability to modify lifestyle (Kandula et al., 2017).

Through discussions with key stakeholders, patients, and research, there is a lack of patient knowledge about prediabetes, how glucose is metabolized in the body, how to eat healthy, and why exercise is important. There is an immense need for a change of practice. Implementing a multimedia-based diabetes prevention (DPP) to educate about lifestyle modifications to reduce the progression of prediabetes and the prevention of type 2 diabetes mellitus will meet that need (ADA, 2018; CDC, 2018; USDHHS, 2014; Watson, 2017). Educating patients and helping them understand what prediabetes is, how to eat healthy, and the importance of aerobic exercise can dramatically improve their health and prevent type 2 diabetes mellitus (CDC, 2018; Watson, 2017). With education, support, and a positive attitude, it is expected that patients will be able to reverse their prediabetes, prevent type 2 diabetes mellitus, and live a long and healthy life.

The needs assessment of the practice was executed by analyzing the strengths, weaknesses, opportunities, and threats (SWOT) (Waxman, 2017). The strengths of the practice are the size of the practice, above average number of patients seen per day, and screening protocols. The practice follows the screening recommendations from the ADA and screens all adults beginning at the age of 45 or younger adults who are overweight, obese, and with at least one additional risk factor by drawing a HbA1c (ADA, 2018). Also, the practice will draw a HbA1c during treatment of prediabetes and diabetes every 3 months until the disease is considered stable with treatment. Some weaknesses of the practice are lack of time to educate patients as mentioned previously, limited education resources, and the small number of employees. The main opportunity of the practice is the prospect to change the current practice by implementing a multimedia-based diabetes prevention (DPP) to educate about lifestyle modifications to reduce the progression of prediabetes and the prevention of type 2 diabetes

mellitus. Another opportunity of the practice would be motivating the prediabetic patients to modify their lifestyle and to adhere to the Diabetes Prevention Program. The CDC's Diabetes Prevention Program is not covered by private insurance companies which causes a major threat to the implementation of the DPP in this practice. If the patient will have to pay out of pocket for the program it will hinder participation. In 2018, Medicare started covering the Medicare Diabetes Prevention Program but specific eligibility is required (Centers for Medicare and Medicaid Services [CMS], 2019).

Problem Statement

Despite the compelling evidence supporting the use of Diabetes Prevention Programs, the treatment of prediabetes in the primary care setting is inadequate (Kandula et al., 2017). According the ADA, several randomized controlled trials reported that intensive lifestyle interventions such as the Diabetes Prevention Program can reduce the incidence of type 2 diabetes mellitus by 58% over 3 years (ADA, 2018). The follow up of the DPP reported a 24% reduction in the rate of progression to type 2 diabetes mellitus at 10 years and 27% at 15 years (ADA, 2018). Early diagnosis of prediabetes and treatment of prediabetes with a DPP can prevent or delay the progression of prediabetes, prevent type 2 diabetes mellitus, improve health outcomes, and reduce the burden of diabetes on society (ADA, 2018; CDC, 2018; Petersen, 2018; Sui, 2015; Watson, 2017). The purpose of this quality improvement project is to determine whether a multimedia-based diabetes prevention program reverses or reduces the progression of prediabetes and prevents type 2 diabetes mellitus.

This project focuses on answering the clinical question, "In a mixed group of English-speaking male and female patients above the age of 18 years old diagnosed with prediabetes (P), how does the implementation of a Multimedia-based Diabetes Prevention Program (I) compared

to usual care (C) affect the progression of prediabetes and the prevention of Type 2 Diabetes Mellitus (O) within a 90-day time period (T)?”

Aims and Objectives

The aim of this project was to reduce the progression of prediabetes and prevent type 2 diabetes mellitus with the implementation of a multimedia-based diabetes prevention program. The multimedia component of the intervention consisted of an educational PowerPoint with voice audio, educational handouts and a questionnaire pre and post intervention. Food diary journals were provided to participants. The option to use the MyFitnessPal application for smartphone devices was demonstrated to record daily food intake and exercises. The project used an educational PowerPoint presentation containing the information from the CDC’s Diabetes Prevention Program curriculum. The educational handouts provided to patients coincided with the information in the PowerPoint to reinforce the material. The food diaries helped patients track what they were eating, provided motivation, encouraged adherence to a healthy diet, and assisted in weight loss.

The objective of this project was to educate patients on lifestyle modifications to delay or stop the progression of prediabetes and prevent type 2 diabetes mellitus. The measurement of the patient’s HbA1c levels at the diagnosis of prediabetes and 90 days post intervention was the measurable outcome. The evaluation objective was to assess the understanding of the material in the Diabetes Prevention Program PowerPoint presentation with a questionnaire that was completed prior to the intervention and immediately after the intervention is implemented. The goal of this DNP project was to change clinical practice with the evidence from research and the success of this novel project.

Review of the Literature

Search Strategy

A systematic approach was used to review the literature. A literature review was completed to investigate three important areas of the clinical question: 1) Determine if the Diabetes Prevention Program (DPP) reverses prediabetes and prevents type 2 diabetes mellitus; 2) the effectiveness of a Multimedia based Diabetes Prevention Program; 3) Utilization of the Diabetes Prevention Program in Primary Care. The electronic databases utilized included PubMed, CINAHL, and Medline in an effort to generate the most pertinent research evidence. The MeSH terms utilized in the search were Prediabetic State, Primary Prevention, Diabetes Mellitus, Type 2, Multimedia, Exercise Therapy, and Diet Therapy. A total of 98 potential sources were found in March of 2019 using a combination of the key terms: *prediabetes*, *Diabetes Prevention Program*, *diabetes prevention*, *effectiveness*, *primary care*, *education video* with the filters *English language*, *human* and publication within the *past 5 years* applied to the search. Of the 98 potential sources found in the search, 10 articles pertained to this quality improvement project and are used in the table of evidence (Appendix A). Of the 10 articles used, all were high or good quality, three articles had an evidence level 1, five articles had an evidence level 2 and the two articles were level 4 and level 5 based on the John Hopkins Nursing Evidence-Based Evidence Appraisal Tool (Dang & Dearholt, 2017). Credible websites were also utilized including the American Diabetes Association (ADA) and the National Institute of Diabetes and Digestive and Kidney Disease (NIDDK) in the search.

Diabetes Prevention Program prevents Type 2 Diabetes Mellitus

From the literature reviewed, the utilization of the Diabetes Prevention Program significantly reduces the progression of prediabetes and prevents type 2 diabetes mellitus (ADA,

2018; Aguiar et al., 2016; Allende-Vigo, 2015; Brunisholz et al., 2017; Dawes et al., 2014; Kramer et al., 2018; Nathan et al., 2015; Michaelides, Raby, Wood, Farr, & Toro-Ramos, 2016; Mudaliar et al., 2016; Sepah, Jiang, Ellis, Mcdermott, & Peters, 2017). The alpha level of .05 was used for all statistical tests in the review of literature. Mudaliar et al. (2016) and Kramer et al. (2018) revealed that DPP lifestyle modification program decreased weight, HbA1c, and fasting blood glucose (FBG). The studies by Aguiar et al. (2016) and Sepah et al. (2017) showed a decrease in weight and HbA1c but did not test FBG. The results of the study by Mudaliar et al. (2016) were statistically significant ($p < .05$) showing a mean decrease in weight of 3.77 kg, HbA1c 0.21%, FBG 2.40 mg/dL. Kramer et al. (2018) showed a statistically significant ($p < .0001$) reduction in weight of 11.2 lbs. and HbA1c of .14% at 6 months and an additional decrease in weight of 10.8 lbs. and HbA1c of .13% at 12 months in the intervention group compared to the control group with the utilization of a DPP lifestyle intervention program among 3 economically different community senior centers. In addition, the study showed a decrease in cholesterol, triglycerides, and fasting blood glucose by implementing a DPP lifestyle intervention further reducing the risk of developing diabetes in the intervention group (Kramer et al., 2018).

A reduction in weight in addition to the prevention of Type 2 diabetes mellitus was seen with the implementation of a DPP lifestyle intervention by studies regardless of the mode of delivery (Aguiar et al., 2016; Allende-Vigo, 2015; Brunisholz et al., 2017; Dawes et al., 2014; Kramer et al., 2018; Nathan et al., 2015; Michaelides et al., 2016; Mudaliar et al., 2016; Sepah et al., 2017). The article by Allende-Vigo (2015) recommended DPP lifestyle modification intervention consisting of moderate physical activity of 150 min/week walk combined with a 500-1000 calorie deficit per day to achieve a 5-10% weight loss proven to reduce type 2 diabetes

mellitus in different at-risk populations. The progression from prediabetes to diabetes can be prevented with lifestyle medication intervention resulting in the recommendation of utilizing the DPP to prevent type 2 diabetes (Allende-Vigo, 2015). The results in the study by Brunisholz et al. (2017) were statistically significant ($p < .001$) showed that a 5% weight loss was 70% more likely in the DPP intervention group compared to the control group within the 6-12 months after enrollment in the study. The study also revealed that the DPP group was less likely to be diagnosed with type 2 diabetes mellitus during the study and the DPP based lifestyle intervention showed a significant decrease ($p < .001$) in the diagnosis of type 2 diabetes mellitus compared to the control group (Brunisholz et al., 2017).

Nathan et al. (2015) revealed the incidence of diabetes was reduced by 58% in the lifestyle intervention group by year 3. The incidence of diabetes was statistically significantly ($p < .0001$) reduced by 27% in the lifestyle intervention compared to placebo group over 15 years (Nathan et al., 2015). The incidence of diabetes was the lowest in the lifestyle intervention group compared to the control group (Nathan et al., 2015). Nathan et al. (2015) noted the benefits of the lifestyle intervention in the Diabetes Prevention Outcome Study (DPPOS) was not only to delay and/or prevent type 2 diabetes mellitus but also reduced metabolic syndrome and cardiovascular disease risk factors. The results of the DPPOS showed positive long-term effects with lifestyle intervention in the reduction of type 2 diabetes mellitus incidence (Nathan et al., 2015). The economic analysis over 10 years showed the lifestyle intervention was also cost-effective promoting the cost effectiveness of implementing this DNP project (Nathan et al., 2015). Furthermore, three studies also showed a decrease in BMI and waist circumference with the utilization of the DPP lifestyle intervention (Aguilar et al., 2016; Dawes et al., 2014; Kramer et al., 2018). Evidence reveals the effectiveness of the DPP lifestyle intervention in delaying the

progression of prediabetes and preventing type 2 diabetes mellitus by reducing weight, HbA1c, FBG, cholesterol, waist circumference, cardiovascular disease risk factors. This evidence gives the rationale for implementation of the DPP in this healthcare delivery innovation project.

The Effectiveness of a Multimedia based Diabetes Prevention Program

The literature review ascertained that a multimedia-based diabetes prevention is effective in reducing the progression of prediabetes and prevents type 2 diabetes mellitus (Aguiar et al., 2016; Michaelides et al., 2016; Sepah et al., 2017). The study by Aguiar et al. (2016) implemented a self-administered DPP which utilized print and video resources containing material on weight loss, exercise, and diet modification specific for type 2 diabetes mellitus prevention. Aguiar et al. (2016) showed a significant decrease in weight ($p < .001$), HbA1c ($p < .002$), body fat percentage, visceral fat area, BMI, waist circumference, aerobic fitness (all $p < .05$) in the intervention group compared to the control group. The prevalence of prediabetes was reduced by 30% in the intervention group (Aguiar et al., 2016). Aguiar et al. (2016) revealed an improvement in T2DM risk factors including weight and HbA1c as a result of the self-administered DPP intervention. The study by Aguiar et al. (2016) showed similar results in the prevention of type 2 diabetes with the use of a multimedia based DPP in comparison to the conventional in-person delivery method.

Both studies by Michaelides et al. (2016) and Sepah et al. (2017) utilized the smartphone digital platform making the DPP curriculum easily accessible. The study by Sepah et al. (2017) implemented the DPP lifestyle intervention utilizing the digital platform via the internet giving the option of using a laptop, desktop, tablet, or smartphone consequently making the DPP easily accessible. Sepah et al. (2017) showed a statistically significant ($p < .0001$) reduction in weight at 16-weeks, 1-year, and 2-year time points of the study. Sepah et al. (2017) also showed a

statistically significant ($p < .0001$) reduction in HbA1c from baseline at year 1 and 2 of the study. The statistically significant reduction in weight ($p < .0024$) and HbA1c ($p < .0005$) at the 3-year mark and during the length of study is the testament of the effectiveness of the digital delivery format of the DPP for short-term and long-term (Sepah et al., 2017). The sustained reduction in HbA1c led to an average reversal from prediabetes range to normal glycemic range (Sepah et al., 2017). Sepah et al. (2017) revealed an association with increased logins and group participation with a statistically significant reduction in weight at weeks 1-16 ($p < .002$), weeks 17-52 ($p < .03$), weeks 1-52 ($p < .01$).

Michaelides et al. 2016 revealed that by utilizing a digital DPP intervention, 64 % of participants saw an over 5% weight loss producing a statistically significant ($p < .001$) reduction in weight at week 16 and 24. The mean weight loss at week 24 was 7.5% (Michaelides et al., 2016). The use of a digital DPP platform met the 5-7% weight loss recommended by the CDC to reduce the risk of developing prediabetes and type 2 diabetes mellitus (CDC, 2018; Michaelides et al., 2016). The study revealed that 84% of participants were highly engaged, completing more than 9 lessons and the higher the participation the more weight loss was also seen (Michaelides et al., 2016). The evidence of weight loss and high participation percentage of the study supports the effectiveness of utilizing a multimedia DPP lifestyle intervention.

Utilization of the Diabetes Prevention Program in Primary Care

The American Diabetes Association (ADA, 2018) recommends primary care practitioners to refer patients diagnosed with prediabetes to an intensive behavioral lifestyle intervention program modeled from the DPP to achieve and maintain a 7% initial weight loss and increase physical activity to at least 150 min/week. Several RCT's demonstrated that DPP reduces the incidence of diabetes by 58% over 3 years (ADA, 2018). The ADA (2018) reported that the

follow up DPP outcomes study, showed a sustained reduction in the progression to diabetes of 34% at 10 years, and 27% at 15 years. A 7% weight loss goal was shown to be feasible and achievable and likely to reduce the risk of developing diabetes (ADA, 2018). The ADA (2018) noted that the Centers for Medicare & Medicaid services decided to expand Medicare reimbursement for the coverage of the CDC DPP and for CDC recognized organizations that become suppliers of the DPP. A cost effectiveness model suggested that DPP and technology assisted DPP is cost effective (ADA, 2018).

Kramer et al. (2018) saw similar results showing a significant decrease in HbA1c, BMI, waist circumference, total cholesterol, triglycerides, and fasting glucose at 6 months and 12 months in the 3 different clinical sites and patients with different socioeconomic status. These results support the generalizability of a DPP in different settings, populations, and socioeconomic classes. The studies by Aguiar et al. (2016) and Michaelides et al. (2016) showed similar results in the prevention of type 2 diabetes with the use of a multimedia based DPP in comparison to the conventional in-person delivery method. The study by Nathan et al. (2015) presented the 10-year economic analysis revealing the lifestyle intervention was cost-effective. The use of a multimedia based DPP intervention has the potential to reduce delivery costs, participant burden, increase participation and to facilitate dissemination in primary care setting in rural and remote areas (ADA, 2018; Aguiar et al., 2016; Michaelides et al., 2016; Nathan et al., 2015).

Inconsistencies

The study by Dawes et al. (2014) showed a statistically significant ($p < .05$) reduction in weight, BMI, waist circumference, and exercise endurance compared to the control group at 6 months. The mean HbA1c in the control group increased by 0.03% compared to the intervention

group that saw a mean decrease in HbA1c of 0.07% (Dawes et al., 2014). The study by Dawes et al. (2014) revealed the between-group 0.1% difference in HbA1c was not significant ($p < .10$). Although this study revealed a reduction in the risk factors that contribute to type 2 diabetes, this study was not able to determine if DPP lifestyle modifications of the intervention group prevented type 2 diabetes mellitus. Also, the ADA (2018) could not confirm that technology assisted DPP to be effective in preventing type 2 diabetes and only recommended the mode of delivery to be considered. These inconsistencies reveal a need for further research in the use of multimedia based DPP interventions and its effects on HbA1c and the prevention of type 2 diabetes mellitus.

In summary, the review of literature supported the utilization of a multimedia based DPP lifestyle intervention to reduce the progression of prediabetes and prevent type 2 diabetes mellitus. In addition, the DPP lifestyle intervention was shown to significantly decrease weight, HbA1c, FBG, BMI, waist circumference, and cholesterol. Evidence revealed that the multimedia based DPP lifestyle intervention was cost effective, helped to relieve the participant burden, increase participation, and can be implemented in the primary care setting.

Theoretical Model

Health Belief Model

The Health Belief Model (HBM) was selected to effectively support the development of this project (Appendix B). The HBM was created by Hochbaum, Rosenstock, and Kegels who were Social Psychologists working for the U.S. Public Health Services in the 1950s (Health Belief Model, 2018). The HBM is one of the original health behavior models which addresses the individual's readiness to take a health-related action or change one's behavior based on the individual's beliefs (Health Belief Model, 2018). The beliefs in the HBM are the individuals

perceived susceptibility, perceived severity, perceived benefits, and perceived barriers (Appendix B) (Health Belief Model, 2018). Perceived susceptibility refers to the individual's belief that they are susceptible or at risk for a disease such as prediabetes or type 2 diabetes mellitus. The patient is susceptible to prediabetes if they have the risk factors such as being age 45 years or older, have a family history of diagnosed type 2 diabetes mellitus, specific ethnic background, have polycystic ovary syndrome, ever being diagnosed with gestational diabetes, or giving birth to a baby weighing 9 pounds or more (CDC, 2018; Watson, 2017). The perceived susceptibility especially refers to the modifiable risk factors for prediabetes including being overweight, having a high percentage of abdominal fat, or being obese, physically inactive, and smoking (CDC, 2018; Watson, 2017). Perceived severity refers to the individual's belief regarding the potential severity of the disease, the complications of prediabetes such as developing type 2 diabetes mellitus, and heart disease. Additionally, prediabetes is associated with a 10% to 40% increased risk for stroke, microvascular disease cardiovascular disease including hypertension and hyperlipidemia (Bergman et al., 2012; CDC, 2018; Siu, 2015). Perceived benefits refer to the perceived benefit of lifestyle modifications such as exercise, eating healthy, and weight loss, and how making those changes will reduce the progression of prediabetes and prevention of type 2 diabetes mellitus. Perceived barriers refer to any barrier or obstacle inhibiting the individual from changing the behavior that would reduce the progression of prediabetes and prevent type 2 diabetes mellitus (Health Belief Model, 2018). This theory suggests that if the patient perceives they are susceptible and at risk for prediabetes and the condition could be a severe threat to their health and to their life, then the patient will be more likely to take action to avoid the progression of prediabetes prompting them to modify their lifestyle by exercising, eating healthy, and losing weight. The likelihood of the patient to make lifestyle modifications is enhanced if the perceived

benefits which is the absence of prediabetes and/or type 2 diabetes mellitus outweighs the perceived barriers.

Two more concepts, cues to action and self-efficacy were added later to help explain the challenges of changing the known unhealthy lifestyle (Healthy Belief Model, 2018). Cues to action is a concept that motivates the patient into action to modify their lifestyle such as educational handouts and the diabetes prevention educational PowerPoint. Self-efficacy is a concept that explains the idea that the patient believes they have the ability take action such as starting an exercise regimen, eating a healthier diet, and logging meals in their food diary. Cues to action and self-efficacy could be utilized with the educational handouts, verbal education, and diabetes prevention educational PowerPoint. The HBM was the framework used to help motivate patients to modify their lifestyle by exercising, eating a healthy diet, and logging their meals in their food diary to aid in their weight loss. With education, support, and a positive attitude, patients were able to reverse their prediabetes, prevent type 2 diabetes mellitus, and live a long and healthy life.

Methodology

The proposed DNP pilot project used a quasi-experimental quantitative design in which the defined population HbA1c level was measured before and three months after the intervention (Tappen, 2016 p.66). According to Moran, Burson, and Conrad (2017) this type of design was practical and useful in the practice setting because the design did not require randomization or a control group. This design used all subjects as the treatment group and exposed all subjects in the pilot study to the intervention (Tappen, 2016, p. 66). This type of design permitted a measurable change in health-related outcome after the intervention when a true experimental design was not feasible (Moran et al., 2017, p. 352). A questionnaire was administered to the

participants before and after the implementation of the multimedia-based diabetes prevention education program assessing the participants knowledge. The project also measured the HbA1c pre and post implementation of the multimedia-based diabetes prevention education program assessing the reduction in the HbA1c level which lead to the potential prevention of type 2 diabetes mellitus.

Setting

The setting for this project was at a large solo internal medicine practice in a suburban setting in central New Jersey. The patients ethnicity seen in this office were diverse. The practice cares for approximately 2,400 patients a year. Approximately 5% of the patients from this large practice were identified as prediabetic. A letter of support (Appendix M) was gained from the Practice where this multimedia-based diabetes prevention education intervention project was completed.

Study Population

This project included a purposeful sample of men and women in central New Jersey from an internal medicine practice that were diagnosed with prediabetes. The purposeful sample method was chosen to focus on the prediabetic population in order to answer the research question for this project. Subject inclusion criteria included English speaking women and men of the age of 18 years of age and older, who had a HbA1c level between 5.7% to 6.4%. and/or had a diagnosis of prediabetes. Subject exclusion criteria was men and women under the age of 18, who did not have a HbA1c level between 5.7% to 6.4%, were diagnosed with type 1 diabetes mellitus, type 2 diabetes mellitus, and pregnant women. Prior power analysis was calculated by utilizing Raosoft, Inc. (2004). With a population size of 114, accepting a 10% margin of error and 95% confidence level, the necessary sample size was 50 participants. To account for

attrition if participants withdrew from the study, an additional 10% was added, bringing the total sample needed to 55 participants.

Subject Recruitment

Information about the multimedia-based diabetes prevention program was shared via recruitment flyers displayed in the office waiting room and each examination room. Efforts to recruit potential participants was also made via in-person recruitment during the office visit by the DNP student and/or participating physician (team member). Recruitment of participants occurred during the scheduled office visit in the exam room or through telephone conversation made by the DNP student after the scheduled appointment. The electronic medical record (EMR) was used to generate a list of potential participants who were active patients with a current diagnosis of prediabetes and/or had a HbA1c level between 5.7% to 6.4%. The diagnosis codes used in the search was the ICD-10 and ICD-9 codes of R73.03 (prediabetes), R73.02 (impaired glucose intolerance), and 790.29(other abnormal glucose). Those potential participants on the list were contacted by the DNP student via telephone to discuss the project and asked for participation. Potential participants were informed that participation in the multimedia-based diabetes prevention program pilot study was a voluntary, complementary service and their decision to participate would not impact the usual care provided. Recruitment material can be found in Appendix C.

Consent Procedure

Patients were considered a vulnerable population. The Rutgers IRB approval was obtained prior to project implementation. Informed consent was obtained in accordance with the IRB requirements from Rutgers University (Appendix D). The consent was created using the

suggested Rutgers IRB template which was customized to fit the objectives of the project. At the time of the intervention patients were given an opportunity to raise any concerns about the study.

Risks/Harms/Ethics

This study posed minimal risk to the participants. There was no anticipated discomfort for participants in the study, so risk to participants was minimal. Participants were informed of any new findings or information that could affect their decision to remain in the study.

Subject Costs and Compensation

There was no cost to participate in this project. Participants did not receive monetary compensation for their participation in the project however, a food diary and educational materials were provided to each participant in the project.

Intervention Design and Resources

The intervention for this project was the implementation of a multimedia-based diabetes prevention education program. The multimedia component of the intervention consisted of an educational PowerPoint with voice audio, educational handouts, food diary journal, MyFitnessPal application for smartphone devices, and a questionnaire pre and post intervention. The project used an educational PowerPoint with voice audio (Appendix E) containing the already validated information from the CDC Diabetes Prevention Program (DPP) the National Institute of Health (NIH) and the National Diabetes Education Program (NDEP). The PowerPoint covered an introduction to prediabetes, risk factors, diagnosis, complications, and treatment (exercise, diet, and weight loss). The diet aspect in the PowerPoint covered healthy eating habits, examples of healthy foods to eat and unhealthy foods to avoid, what foods to choose when dining out. The exercise aspect in the PowerPoint included types of physical activity, length of physical activity needed, and examples of exercise. The educational handouts

provided to patients coincided with the information in the educational PowerPoint reinforcing the material. The educational handouts (Appendix F) provided to the patients came directly from the CDC DPP and the NIH NDEP curriculum available to print for healthcare professionals. The *Choose More than 50 Ways to Prevent Type 2 Diabetes* education handout was printed from the NDEP website and discussed tips on how to eat well, stay active, and track progress. The *Eating Well to Prevent T2* handout discussed how to eat well, how to build a healthy meal, items in each food group and *Eating Well Away from Home* handout discussed challenges of eating well at restaurants and social events and how to cope with these challenges which both were printed directly from the CDC curriculum website. The two fact sheets on physical guidelines were specifically tailored for adults and older adults which was printed directly from the CDC website. The *Get Active to Prevent T2* handout discussed the benefits of physical activity and ways to get physically active which was printed directly from the CDC curriculum website.

The food diary journal (Appendix G) provided helped patients track food and water intake through the day, track daily activity and exercises, provided motivation, encouraged adherence to a healthy diet and exercise and assisted in weight loss. The food diary journal also had a section to measure chest, waist, hips, thighs, calf and weight at day 1 and day 90 to document progress. The food diaries were bought from Amazon Inc by the DNP student. Participants had the option to use an application (app) that tracked calories consumed and exercise completed named MyFitnessPal. The application was available for participants to download on their smartphone for free (Appendix H). The application was available via iOS or Android platform on the participants smartphone, iPhone, iPad, and iPod touch which could be synced to many different apps and devices to make tracking the participants diet and exercise easy and accessible. The educational PowerPoint with voice audio, educational handouts, food

diary journal, and the MyFitnessPal application was the foundation which made this project a multimedia-based diabetes prevention education intervention.

The intervention was implemented at the time the participant agreed to partake in the pilot study which was at the office visit or at the earliest convenience for the participant to come back to the practice. The intervention was implemented in one of the exam rooms at the internal medicine practice. A pre-intervention questionnaire (Appendix I) was provided to the participant to complete before the start of the multimedia-based diabetes prevention education intervention which assessed the participants baseline knowledge. The educational PowerPoint with voice audio was presented utilizing the DNP student's personal laptop or iPad. The educational handouts were given to the participant after the PowerPoint presentation to reinforce the content. The post-intervention questionnaire (Appendix I) was given to the participant after the educational aspect of the intervention was completed. Both questionnaires took approximately 10 minutes to complete.

At the end of the session, the participant was given the option to use the food diary journal or the MyFitnessPal application which provided motivation, encouraged adherence to healthy diet and exercise and assisted in weight loss. A follow up phone call was completed monthly that encouraged adherence to healthy diet and exercise and assisted in weight loss. A follow up blood draw date was given to the participant on approximately day 90 of the study. A routine HbA1c level was drawn at the usual follow up as per the internal medicine practice routine follow up protocol for the prediabetic population. A decrease in the HbA1c level showed the intervention was successful.

Sources of Data

The paper questionnaire was created using the Diabetes Knowledge Test (DKT) and the Risk Perception Survey for Developing Diabetes (RPS-DD) from the Michigan Diabetes Research Center (MDRC) Survey Instruments for Health Professionals (University of Michigan, 2019). The questionnaire was tailored specifically to assess the participants' knowledge before and after the educational portion of the multimedia-based diabetes prevention education intervention. Both surveys were researched and tested by MDRC. Cronbach's coefficient alpha was used to calculate the reliability of the DKT resulting in score of (.77) supporting the reliability and validity of the DKT (Fitzgerald et al., 2016). Each question in the questionnaire was either true or false. This type of questioning was chosen for simplicity and familiarity to the participants. The questionnaire took approximately 10 minutes to complete. Since the questionnaire used for this project was tailored specifically to information pertaining to the educational material, the reliability and validity of this specific questionnaire tool did not exist.

As discussed previously, the content in the PowerPoint came directly from the information in the CDC Diabetes Prevention Program (DPP) and the National Institute of Health (NIH) National Diabetes Education Program (NDEP). The content in the CDC DPP program and the NDEP was carefully reviewed by NIH scientists and other experts. The educational handouts were printed directly from the CDC and NDEP website.

Outcome Measures

Participant baseline data was retrieved from the electronic medical record Practice Fusion at the start of the project after participation was consented. The variables included in the baseline data were age, gender, weight, body mass index (BMI), serum hemoglobin A1C (HbA1c). The participant data was assigned a number and only the DNP student had access to

that information. The variables included in the post intervention data were HbA1C, weight, and BMI and was obtained by completing a retrospective chart review after the study period ended which was approximately 90 days. The data from the questionnaire was collected immediately before and after the intervention. All data was entered into the Statistical Software IBM SPSS Statistics System by the DNP student for statistical analysis.

Timeline

The timeline for the DNP Project started with the Project Proposal presented to the Project Team in April 2019. The application to the IRB was completed and submitted no later than May 30, 2019 and was approved July 22, 2019. After the approval of the IRB, the recruitment of participants, implementation, and data collection occurred in September 2019. Data analysis started in December 2019 and continued for two months. The evaluation and writing of the results of the study started in January 2020 and continue for the next three months. The presentation of the final product of the DNP Project will occur in March 2020. The highly anticipated graduation is May 2020. The project timeline is represented using a GANTT Chart and is provided in Appendix J.

Budget

This DNP Project was not funded and all costs associated with this project was the sole responsibility of the DNP student. The cost of supplies was \$562.07. The supplies utilized for this project were Recruitment Flyers, Educational Materials, Food Diary Journal, the purchase of Statistical Software IBM SPSS Statistics System, LEARD Statistics Programs, and dissemination posters. The DNP student personally absorbed any other costs that arose. The budget is located in Appendix K.

Evaluation Plan

The HbA1c, weight, and BMI was all extracted from the electronic medical records by performing a retrospective chart review 90 days post intervention. A decrease in HbA1c, weight, and BMI were the primary measurements evaluating if the multimedia-based diabetes prevention educational intervention was successful. The post intervention questionnaire scores assessed the participants knowledge of prediabetes and the prevention of type 2 diabetes from the multimedia-based diabetes prevention educational intervention. An increase in post intervention questionnaire scores indicated the improvement in participants knowledge proving the intervention was successful.

Data Analysis

Statistical Software IBM SPSS Statistics System was used for the completion of data analysis. Descriptive statistics were used to describe the sample of participants. Descriptive statistics also compared the retrospective chart review findings of the HbA1c, weight, BMI pre and post intervention. A paired *t* test was used to assess the change in the variables weight, BMI, HbA1c from baseline to 90 days post intervention. The correct scores on the questionnaire was added up and treated as the total score of the outcome variable. The scores correct ranged from zero to one hundred for each participant. The pre/post intervention questionnaire scores were the continuous variable. A paired *t* test was used to compare the pre/post questionnaire means. Analytical statistics were used to determine the efficacy of the project intervention. An alpha of 0.05 was used for all statistical tests in this study.

The sample size was four participants encompassing three females and one male. The mean age of the participants was 63 years old. The participant mean weight loss at the completion of the project was 4lbs, 95% CI. The participant mean decrease in the BMI at the

completion of the project was 0.7 kg/m², 95% CI. The participant mean decrease in the HbA1c at the completion of the project was 0.15%, 95% CI. The participant mean increase in the post intervention questionnaire score at the completion of the project was 7.5 points, 95% CI.

Overall, the participant weight, BMI, and HbA1c all decreased at the completion of the project. There was a 10 point increase in the score of the post intervention score of three participants and one participant scored a 100% on both the pre and post intervention questionnaire. The results showed that there was an increase in participant knowledge about prediabetes and type 2 diabetes mellitus prevention after the completion of the multimedia-based diabetes prevention educational intervention.

Data Security and Maintenance

Data was collected from participants and the electronic medical record system, Practice Fusion. The personal data of the participant was assigned a number by creating a master list and only the DNP student had access to the master list. The master list linking the personal data to the assigned number was only kept until data collection was completed and then was destroyed. By taking this protective measure, participant data was reviewed without the participant identity being recognized. Age, gender, weight, body mass index (BMI), hemoglobin A1C (HbA1c), and questionnaire results were collected. Participant data was de-identified with a number to compare HbA1C, weight, BMI, and questionnaire results pre and post intervention. The participant data in the electronic medical record, Practice Fusion, was protected with a password and the de-identified participant data on the DNP student's personal computer was protected with a password that only the DNP student had access to. Upon completion of the project, closure of the IRB, and final writing of the DNP Project, all data was destroyed in accordance

with Rutgers University guidelines. The hard copy of the participants consents and data was kept in a locked file cabinet in the chair's office at Rutgers University and will be kept for five years.

Discussion

It was anticipated that the participants knowledge on prediabetes and type 2 diabetes mellitus prevention would be improved after the completion of the multimedia-based diabetes prevention educational intervention. The HbA1c, weight, and BMI were also projected to decrease after the implementation of the multimedia-based diabetes prevention educational intervention. These projected outcomes were supported by previous studies that implemented a multimedia-based diabetes prevention program (Aguiar et al., 2016; Michaelides et al., 2016; Sepah et al., 2017).

The objective of this project was to educate patients on lifestyle modifications to delay or stop the progression of prediabetes and prevent type 2 diabetes mellitus. The objective of this project was successfully met with the implementation of the educational Diabetes Prevention Program. The decrease in the patients HbA1c levels at the diagnosis of prediabetes and 90 days post intervention met the measurable outcome. The participants post intervention weight and BMI were also decreased at the completion of the project. The results corroborated that the implementation of the DPP delayed or stopped the progression of prediabetes and prevented type 2 diabetes mellitus. The evaluation objective was met with the implementation of the educational Diabetes Prevention Program PowerPoint presentation. The average questionnaire scores improved from the pre intervention questionnaire to the post intervention questionnaire. This helped the participants further understand how to eat healthier and incorporate exercise in their daily routine reducing the progression of prediabetes.

The key facilitator was the team member. The team member was also the owner and main physician at the practice and helped recruit participants for the project. During a patient's scheduled office visit the team member would discuss the DNP pilot project with the patient and if the patient sounded interested she would add the patient's name to the recruitment list. Unfortunately, when the potential participant would be reached, the DNP student was faced with hesitation and excuses such as that the participant was too busy with work, family, upcoming holiday seasons, or the participant was not ready to start an exercise and diet regimen. These were the most common reasons why potential participants would not enroll in the project. Barriers that impacted the project were the recruitment process and participant retention. There was not a large sample size that participated despite the effort of using the recruitment flyers, building a list of patients with prediabetes from the practice electronic medical record, and calling to recruit participants. This major barrier affected the sample size and consequently affected the results and success of the project. Another barrier of the project was participant retention. There was an original sample size of six but two participants were not able to be reached when the follow up was needed making the sample size used in the project four. The follow up only consisted of the participant coming back to the practice to have the HbA1c blood drawn 90 days after their project start date. This date varied for each participant and the month and week was provided to the participant. Retrospectively, a follow up nurse visit should have been scheduled at the time of the project implementation appointment. Doing so would put the participant in the practice's appointment reminder system and the usual appointment confirmation would be completed increasing the chances that the participant would show up to the follow up blood draw appointment. Since the two participants were not able to be contacted, the reason for lack of retention was not determined. Even though the sample size was small, the

participants did support the use of the multimedia, in person aspect of the project. The implementation of the project supported the literature proving that the use of a multimedia based DPP intervention reduced delivery costs, participant burden, increased participation and facilitated dissemination in the primary care setting in rural and remote areas (ADA, 2018; Aguiar et al., 2016; Michaelides et al., 2016; Nathan et al., 2015).

Implications

The implications of this multimedia based DPP intervention is that it minimized the gap in care by educating patients about lifestyle modifications (diet, exercise, weight loss), reduced the progression of prediabetes and prevented type 2 diabetes mellitus. There was minimal to no financial cost to the practice by creating and implementing the educational PowerPoint presentation. There was also no financial cost to the participants by participating in the DNP project. The multimedia based DPP intervention saved the practitioner time and improved quality of patient care. Instead of educating patients for five minutes, the practitioner can simply play the PowerPoint which ensures the patient has received the proper education about their condition and how to treat prediabetes. Implementing the DPP into clinical practice reduces delivery costs and participant burden, improves quality of care, and saves the practitioner time.

Plans for Sustainability and Translation

The aim of this project is for the team member to continue with the dissemination and implementation of the multimedia-based diabetes prevention intervention after the project has concluded. In addition, the goal is for this multimedia-based diabetes prevention education program to become part of the standard of care in the primary care setting. Access to care will be increased by making this information easily available to the community by providing the education PowerPoint with audio to health centers, YMCA's and other Primary Care Offices to

promote the prevention of type 2 diabetes mellitus. As a future Advanced Practice Nurse, bridging the gap between the patient knowledge about prediabetes and the prevention of type 2 diabetes mellitus is important. This was a quality improvement project intended to change clinical practice.

Professional Reporting and Future Scholarship

The goal is to publish the findings of this DNP Project in the Journal of the American Association of Nurse Practitioners (JAANP). This project will be presented at the Rutgers DNP Project Poster Day to inform fellow future Advance Practice Nurses how to treat prediabetes. This project provided the foundation for future scholarship towards discovering new ways to promote healthier lifestyles resulting in the prevention of type 2 diabetes mellitus.

Summary

The aim and objective was met showing that education on lifestyle modification delays progression of prediabetes and prevent type 2 diabetes mellitus. The average questionnaire scores improved from the pre intervention questionnaire to the post intervention questionnaire. This helped the participants further understand how to eat healthier and incorporate exercise in their daily routine in an effort to reduce the progression of prediabetes. The participants post intervention HbA1c, weight and BMI were decreased at the completion of the project supporting the implementation of the DPP to delay or stop the progression of prediabetes and prevent type 2 diabetes mellitus. The implementation of the multimedia-based diabetes prevention program helped minimize the gap in care by educating patients about lifestyle modifications (diet, exercise, weight loss), reducing the progression of prediabetes and lead to the prevention of type 2 diabetes mellitus. This project provided the foundation for future scholarship towards

discovering new ways to promote healthier lifestyles resulting in the prevention of type 2 diabetes mellitus.

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Appendix A

Table of Evidence

EBP Question: In a mixed group of English-speaking male and female patients above the age of 18 years old diagnosed with prediabetes, how does the implementation of a Multimedia based Diabetes Prevention Program compared to usual care affect the progression of prediabetes and the prevention of Type 2 Diabetes Mellitus within a 90-day time period?

Date: May 9, 2019

Article #	Author & Date	Evidence Type	Sample, Sample Size, Setting	Study findings that help answer the EBP Question	Limitations	Evidence Level & Quality
1	Aguiar, Morgan, Collins, Plotnikoff, Young & Callister, 2016	Randomized Control Trial	Assessor-blinded, parallel-group N=53 (Intervention) N= 48 (Control) N=101 (Sample Size) Male population [REDACTED] Australia	Intervention group saw a significant decrease in weight, HbA1c, Insulin, BMI, waist circumference, fat mass, body fat percentage, visceral fat area than the control group. The prevalence of prediabetes was reduced by 30% in the intervention group. The Lifestyle	Key limitations of this study were the short duration of the trial, target male population resulted in the only being able to generalize the results to the male population.	Level 1, High Quality appraisal as it is consistent, generalizable results, sufficient sample size, adequate control, definitive conclusion, consistent recommendation based on review of literature and includes thorough reference and scientific evidence.

				intervention revealed an improvement in T2DM risk factors including weight and HbA1c. Self-administered DPP has a potential to reduce costs, participant burden and could be disseminated in community settings such as medical practices, workplaces, and pharmacies.		
2	Allende-Vigo, 2015	Literature Review	<input checked="" type="checkbox"/> NA	Lifestyle modification intervention consisting of moderate physical activity of 150 min/week walk combined with a 500-1000 calorie deficit	Key limitations of the literature review were most sources were used were not published in the last 5 years.	Non-Research, Level 5, Good Quality appraisal because the expertise is credible, draws fairly definitive conclusions and provides logical argument.

				per day to achieve a 5-10% weight loss has consistently proven to reduce type 2 diabetes mellitus in different at-risk populations. The progression from prediabetes to diabetes can be prevented with lifestyle medication intervention resulting in the recommendation of utilizing the DPP to prevent type 2 diabetes.		
3	American Diabetes Association 2018	Position Statement	<input checked="" type="checkbox"/> NA	The American Diabetes Association (ADA) recommends to refer patients diagnosed with prediabetes to	<input checked="" type="checkbox"/> NA	Level 4, Good Quality appraisal because the material is sponsored by a professional private organization,

				<p>an intensive behavioral lifestyle intervention program modeled on the DPP to achieve and maintain a 7% initial weight loss and increase physical activity to at least 150 min/week. Technology assisted DPP may be effective in preventing type 2 diabetes and should be considered. A cost effectiveness model suggested that DPP and technology assisted DPP is cost effective. Several RCT's demonstrated</p>		<p>reasonable and thorough systematic literature search strategy, consistent results, sufficient numbers of well-designed studies, national expertise is clearly evident, and revised within the last 5 years.</p>
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				<p>that DPP reduces the incidence of diabetes by 58% over 3 years. The DPP outcomes follow up study showed a sustained reduction in the progression to diabetes of 34% at 10 years, 27% at 15 years. A 7 % weight loss goal was shown to be feasible and achievable and likely to reduce the risk of developing diabetes. The Centers for Medicare & Medicaid services decided to expand Medicare reimbursement for the coverage</p>		
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				of the CDC DPP and for CDC recognized organizations that become suppliers of the DPP.		
4	Brunisholz, Joy, Hashibe, Gren, Savitz, Hamilton, Cannon, Huynh, Schafer, Newman, Parker, Musselman & Kim, 2017	Quasi-Experimental Study	DPP Participation N= 573 No DPP participation N=2,292 (1:4 match) Intermountain Healthcare encompassing 22 hospitals, a medical group with more than 185 ambulatory physician clinics, estimated 1,100 primary and secondary care physicians, in Utah and Southeastern Idaho.	DPP group were 70% more likely to achieve a 5% weight loss and less likely to be diagnosed with type 2 diabetes mellitus during the study as compared to the control group. The DPP based lifestyle interventions showed a significant reduction in type 2 diabetes mellitus when compared to control group.	Key Limitations include: Randomization of sample was a limitation of the study. Difference in multiple settings of intervention and control groups. Data collection instrument reliability and validity was not discussed.	Level 2, High Quality appraisal as it is consistent, generalizable results, sufficient sample size, adequate control, definitive conclusion, consistent recommendation based on review of literature and includes thorough reference and scientific evidence.

5	Dawes, Ashe, Campbell, Cave, Elley, Kaczorowski, Sohal, Ur & Dawes, 2014	Randomized Control Trial	<p>N= 33 (Intervention) N=23 (Control) N= 60 (Sample Size)</p> <p>Cluster Randomization</p> <p>Family Practices in urban and rural British Columbia.</p>	<p>A weight decrease between groups of 3.2 kg (95% CI, 1.7 to 4.6) at the 6 month point of the study. The Diabetes Prevention Program Facilitated Lifestyle Intervention Prescription (FLIP) showed a significant decrease in waist circumference of 3 cm (95% CI, 0.3 to 5.7) at the 6 month point of the study. The HbA1c decreased by - 0.10 (95% CI 0.03 to -0.23) between groups at the 6 month point of the study.</p>	Key Limitations include: type of randomization was cluster, short duration of study, and the study was not statistically significant for some outcomes.	Level 1, Good Quality appraisal because the study shows reasonably consistent results, sufficient sample size for the study design, some control, fairly definitive conclusions, and reasonably consistent recommendation based on literature review that include scientific evidence.
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6	Kramer, Vanderwood, Arena, Miller, Meehan, Eaglehouse, Schafer, Venditti, & Kriska, 2018	Quasi Experimental Study	N=134 N=88 (immediate intervention) N=46 (delayed intervention) 2:1 Randomized 6- month delayed control intervention design. 3 senior/community centers in Allegheny County, PA	Pre and Post changes from baseline at 6 months the average weight loss was 11.2lbs, significant decrease in HbA1c, BMI, waist circumference, total cholesterol, triglycerides, and fasting glucose. At 12 months the decrease mean weight loss was 10.8 lbs. with significant decreases in HbA1c, BMI, waist circumference, total cholesterol, triglycerides, and fasting glucose. Similar results were found in the 3	Key limitations were limited generalizability to different race/ethnicity. Factors that influenced changes is physical activity such as the weather was a limitation of the study.	Level 2, High Quality appraisal as it is consistent results, sufficient sample size, adequate control, definitive conclusion, consistent recommendation based on review of literature and includes thorough reference and scientific evidence.
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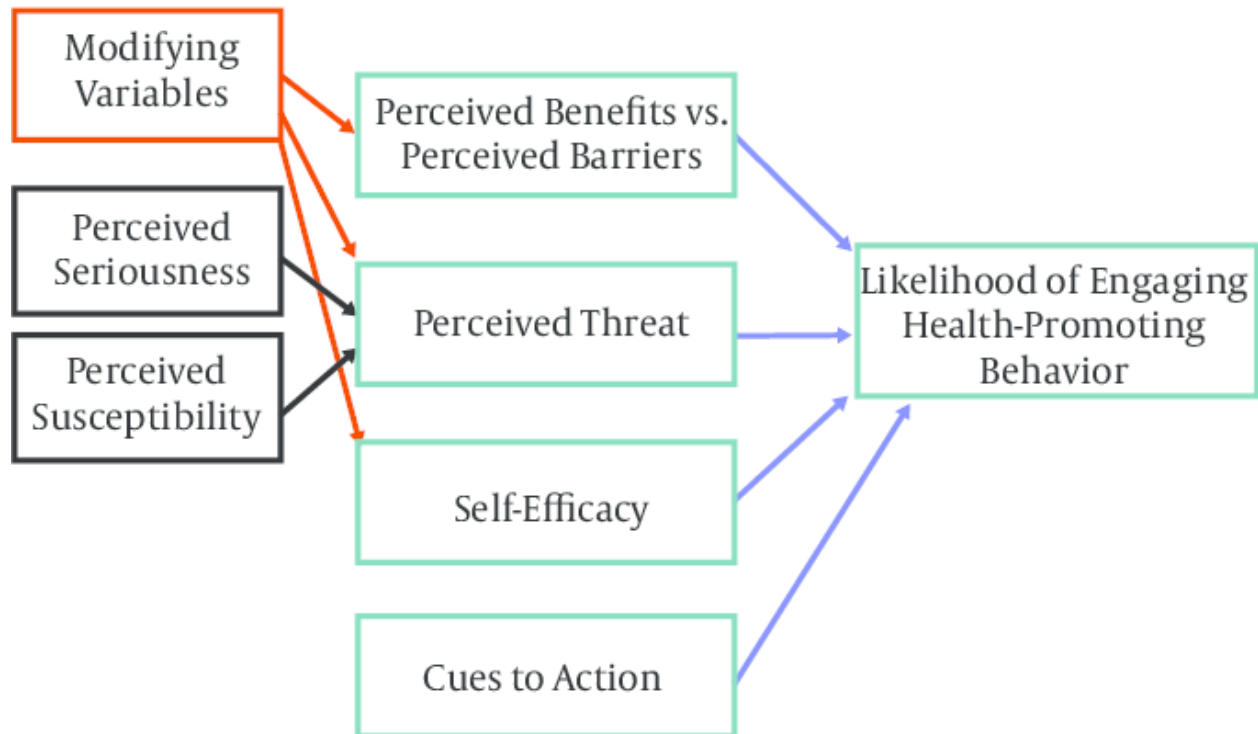
				different sites and different socioeconomic status.		
7	Michaelides, Raby, Wood, Farr, & Toro-Ramos, 2016	Quasi-Experimental	N= 43 (Intervention) N= 121 (Sample Size)	At week 16 and 24, 64% of participants saw over 5% of weight loss. Mean weight loss at week 24 was 7.5%. 84% of participants were highly engaged completing more than 9 lessons. The higher the participation the more weight loss was seen. The use of a digital DPP platform met the 5-7% weight loss recommended by the CDC. The evidence of weight loss and	Key limitations of the study were lack of a control group and short duration of study.	Level 2, Good Quality appraisal because the study shows reasonably consistent results, sufficient sample size for the study design, some control, fairly definitive conclusions, and reasonably consistent recommendation based on literature review that include scientific evidence.

				high participation percentage of the study supports the effectiveness of utilizing a multimedia DPP intervention.		
8	Mudaliar, Zabetian, Goodman, Echouffo-Tcheugui, Albright, Gregg & Ali, 2016	Systematic Review and Meta- Analysis Study	N= 8,995 participants Setting was Clinical centers across the U.S.	The Diabetes Prevention Program decreased weight, fasting blood glucose, and HbA1c similarly in the original DPP study despite modifications such as lowering cost of program, and improved acceptability across various settings. Electronic and remote interventions were successful and could be distributed	Key limitations include heterogeneity of studies included such as duration of follow-up, location of intervention delivery, format of intervention delivery. Lack of statistical significance due to large, overlapping confidence interval and conservative definition of statistical significance of non-overlapping confidence	Level 2, High Quality appraisal as it is consistent, generalizable results, sufficient sample size, adequate control, definitive conclusion, consistent recommendation based on review of literature and includes thorough reference and scientific evidence.

				nationally across the nation.	intervals. Lastly quality of studies varied.	
9	Nathan, Barrett-Connor, Crandall, Edelstein, Goldberg, Horton, Knowler, Mather, Orchard, Pi-Sunyer, Schade, & Temprosa 2015	Cohort Multiple Randomized Controlled Trial	N=935 (Placebo) N=926 (Metformin) N= 915 (Lifestyle Intervention) N=3141 (Sample Size) 27 Medical centers in the United States	The incidence of diabetes was reduced by 58% in the lifestyle intervention group by year 3. The incidence of diabetes was significantly reduced by 27% in the lifestyle intervention compared to placebo group over the 15 years. Over 15 years the incidence of diabetes was 55% but the incidence of diabetes over 15 years was the lowest in the lifestyle intervention. Benefits of the lifestyle intervention in	The Key limitation of the study was the offering the lifestyle intervention to all three groups during the 1-year bridge period at the end of the DPP trial.	Level 1, High Quality appraisal as it is consistent, generalizable results, sufficient sample size, adequate control, definitive conclusion, consistent recommendation based on review of literature and includes thorough reference and scientific evidence.

				<p>the DPPOS study was delay and/or prevention of diabetes, reduction in cardiovascular disease risk factors and metabolic syndrome. The prevalence of lower urinary tract symptoms associated with obesity and diabetes was reduced resulting in improved quality of life. The results of the DPPOS showed positive long-term effects with lifestyle intervention.</p> <p>The economic analysis over 10 year showed the lifestyle intervention was cost-effective.</p>		
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10	Sepah, Jiang, Ellis, McDermott, & Peters, 2017	Quasi-Experimental, Single-Arm, Non-Randomized Longitudinal Study	N= 220 DPP lifestyle intervention was accessible via the internet enabled desktop or mobile device in the United States.	Weight and HbA1c was significantly reduced from the baseline at 16-week, 1-year, 2-year, and the 3-year time point. The significant weight loss and reduction in HbA1c during the study and at the 3-year mark is a testament to the effectiveness of the digital delivery format of the DPP for short- term and long-term.	Key limitations of the study were small sample size, increase in participation over time resulting in above average long-term clinical outcomes.	Level 2, High Quality appraisal as it is consistent results, sufficient sample size, adequate control, definitive conclusion, consistent recommendation based on review of literature and includes thorough reference and scientific evidence.
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Appendix B**Health Belief Model**

(Dadgarmoghaddam, Khajedaluae, & Khadem-Rezaiyan, 2016)

Appendix C

Recruitment Flyer

Rosemary Dougherty

Participants Needed!

DNP Project:

**“A Novel Approach to Diabetes Prevention:
Implementation of a Multimedia-Based
Diabetes Prevention Program”**

Who is eligible for this Quality Improvement Study?

- Are you a Male or Female Older than 18•
- Do you have Prediabetes•
- Do you Need a Change **NOW**•

You can Join!

A Multimedia-Based Diabetes Prevention Program to Teach you How to
Modify your Lifestyle with a Healthy Diet, Food Journal, Exercise, and
Assess if Lifestyle Modifications can
Reverse Prediabetes and Prevent Type 2 Diabetes!

Study Location: Right here!

What is the Intervention Process?

- Consent•Educational PowerPoint•
- Educational Material Provided•
- Pre/Post Questionnaire•

Examples of What to Eat and How Much


Examples of Easy Exercises such as Walking, Playing with your Kids,
Or even your Grandkids


Free Food Diary Journal Included with Participation!

3 Month Study

FOR MORE INFORMATION CONTACT:

Rosemary Dougherty
Student Nurse Practitioner





VERSION 1: 4/11/19

Appendix D

Consent



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CONSENT TO TAKE PART IN A QUALITY IMPROVEMENT STUDY

TITLE OF STUDY: "A Novel Approach to Diabetes Prevention: Implementation of a Multimedia- Based Diabetes Prevention Program"

Principal Investigator: Dr. Kathy T Gunkel, DNP, APN, WHNP-C

Co-Principal Investigator: Rosemary Dougherty BSN, RN

Welcome! My name is Rosemary Dougherty and I am Doctoral Nurse Practitioner Student at Rutgers School of Nursing. You are being asked to participate in a quality improvement study that I am conducting as part of my final DNP Project.

STUDY SUMMARY: This consent form is part of an informed consent process for a quality improvement study and it will provide information that will help you decide whether you want to take part in this study. It is your choice to take part or not. The purpose of the study is to: determine whether a Multimedia-Based Diabetes Prevention Program reverses or reduces the progression of prediabetes and prevents type 2 diabetes mellitus. The study will also assess if the participants knowledge about prediabetes will be improved after the educational intervention.

If you take part in the study, you will be asked to complete a pre-intervention questionnaire, watch a PowerPoint presentation about prediabetes, the treatment of prediabetes, and complete a post-intervention questionnaire. You will also be encouraged to utilize the educational material provided and partake in increasing physical activity, eating a healthy diet, and try to lose weight. A food diary journal will be provided to document your diet and physical activity. You also have an option to use the MyFitnessPal application on your personal smartphone to track your diet and physical activity. Your time in the study will take approximately 40 minutes. The pre-intervention questionnaire will take approximately 10 minutes. The educational PowerPoint intervention will take approximately 20 minutes. The post-intervention questionnaire will take approximately 10 minutes. The length of the subjects' participation in the study will be 90 days. The study will end in May 2020. This study poses minimal risk to the participants. There is no anticipated discomfort for participants in this study, so risk to participants is minimal. Participants will be informed of any new findings or information that may affect their decision to remain in the study. Possible benefits of taking part of this study may be reversal of prediabetes, weight loss, enhanced knowledge about prediabetes, diet, and exercise. Your alternative to taking part in the study is not to take part in it.

The information in this consent form will provide more details about the quality improvement study and what will be asked of you if you choose to take part in it. If you have any questions now or during the study, if you choose to take part, you should feel free to ask them and should expect to be given answers you completely understand. After all of your questions have been answered and you wish to take part in the study, you will be asked to sign this consent form. You are not giving up any of your legal rights by agreeing to take part in this study or by signing this consent form.

**CONSENT TO TAKE PART IN A QUALITY IMPROVEMENT STUDY****TITLE OF STUDY: "A Novel Approach to Diabetes Prevention: Implementation of a Multimedia- Based Diabetes Prevention Program"****Principal Investigator:** Dr. Kathy T Gunkel, DNP, APN, WHNP-C**Co-Principal Investigator:** Rosemary Dougherty BSN, RN

Welcome! My name is Rosemary Dougherty and I am Doctoral Nurse Practitioner Student at Rutgers School of Nursing. You are being asked to participate in a quality improvement study that I am conducting as part of my final DNP Project.

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If you take part in the study, you will be asked to complete a pre-intervention questionnaire, watch a PowerPoint presentation about prediabetes, the treatment of prediabetes, and complete a post-intervention questionnaire. You will also be encouraged to utilize the educational material provided and partake in increasing physical activity, eating a healthy diet, and try to lose weight. A food diary journal will be provided to document your diet and physical activity. You also have an option to use the MyFitnessPal application on your personal smartphone to track your diet and physical activity. Your time in the study will take approximately 40 minutes. The pre-intervention questionnaire will take approximately 10 minutes. The educational PowerPoint intervention will take approximately 20 minutes. The post-intervention questionnaire will take approximately 10 minutes. The length of the subjects' participation in the study will be 90 days. The study will end in May 2020. This study poses minimal risk to the participants. There is no anticipated discomfort for participants in this study, so risk to participants is minimal. Participants will be informed of any new findings or information that may affect their decision to remain in the study. Possible benefits of taking part of this study may be reversal of prediabetes, weight loss, enhanced knowledge about prediabetes, diet, and exercise. Your alternative to taking part in the study is not to take part in it.

The information in this consent form will provide more details about the quality improvement study and what will be asked of you if you choose to take part in it. If you have any questions now or during the study, if you choose to take part, you should feel free to ask them and should expect to be given answers you completely understand. After all of your questions have been answered and you wish to take part in the study, you will be asked to sign this consent form. You are not giving up any of your legal rights by agreeing to take part in this study or by signing this consent form.

**Who is conducting this study?**

Dr. Kathy T Gunkel, DNP, APN, WHNP-C is the Principal Investigator of this quality improvement project. A Principal Investigator has the overall responsibility for the conduct of the study. However, there are often other individuals who are part of the quality improvement study team.

Rosemary Dougherty BSN, RN is the Co-Principal Investigator of this quality improvement study. Rosemary Dougherty BSN, RN may be reached at [REDACTED] or [REDACTED]. The Co-Principal Investigator also has the overall responsibility for the conduct of the study. The Co-Principal Investigator or another member of the study team will also be asked to sign this informed consent. You will be given a copy of the signed consent form to keep.

Why is this study being done?

The purpose of the study is to determine whether a Multimedia-Based Diabetes Prevention Program reverses or reduces the progression of prediabetes and prevents type 2 diabetes mellitus. The study will assess if educating the subjects about prediabetes, the risk factors, symptoms, how prediabetes is diagnosis, complications of prediabetes, and the of treatment which is exercise, diet, and weight loss will reduce the progression of prediabetes and prevents type 2 diabetes mellitus.

Who may take part in this study and who may not?

Participants who may take part in this study must speak English, be a women or man of the age of 18 years of age and older, who has a HbA1c level between 5.7% to 6.4%, and/or has a diagnosis of Prediabetes. Participants who cannot take part of the study are those who are already diagnosed with type 1 diabetes mellitus, type 2 diabetes mellitus and women who are pregnant.

Why have I been asked to take part in this study?

You have been asked to participate in this study because you have been diagnosed with Prediabetes.

How long will the study take and how many subjects will take part?

Approximately 55 subjects will be asked to participate in the study. The project intervention will take place in the Internal Medicine Practice office. The pre-intervention questionnaire will take approximately 10 minutes. The educational PowerPoint intervention will take approximately 20 minutes. The post-intervention will take approximately 10 minutes. The length of the subjects' participation in the study will be 90 days. The study will end in May 2020.

What will I be asked to do if I take part in this study?

If you take part in this quality improvement study, you will be asked to complete a pre-intervention questionnaire, watch a PowerPoint presentation about prediabetes, how to treat prediabetes with a healthy diet and increased physical activity. You will then complete a post-intervention questionnaire. You will also be encouraged to utilize the educational material provided and partake in increasing physical activity, eating a healthy diet, and try to lose weight.



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A food journal will be provided to document your diet and exercise. You also have an option to use the MyFitnessPal application on your personal smartphone to track your diet and exercise. You will then have a routine follow up office visit with your Physician.

What are the risks and/or discomforts I might experience if I take part in this study?

This study poses minimal risk to the participants. There is no anticipated discomfort for participants in this study, so risk to participants is minimal. Participants will be informed of any new findings or information that may affect their decision to remain in the study. There is no physical, psychological, social, financial, or reproductive risk associated with this study.

Are there any benefits to me if I choose to take part in this study?

The expected benefits of taking part in this study may be the reversal of prediabetes, weight loss, enhanced knowledge about prediabetes, diet, and exercise. However, it is possible that you may not receive any direct benefit from taking part in this study.

What are my alternatives if I do not want to take part in this study?

Your alternative is not to take part in this study.

How will I know if new information is learned that may affect whether I am willing to stay in the study?

During the course of the study, you will be updated about any new information that may affect whether you are willing to continue taking part in the study. If new information is learned that may affect you after the study or your follow-up is completed, you will be contacted.

Will there be any cost to me to take part in this study?

There will be no cost to participate in this study.

Will I be paid to take part in this study?

You will not be paid to take part in this study.

How will information about me be kept private or confidential?

All efforts will be made to keep your personal information in your record confidential. Participants data will be collected from participants and the electronic medical record system Practice Fusion. The personal identity data of the participant will be assigned a number by creating a master list and only the Co-Principal Investigator will have access to this master list. The master list linking the personal data to assigned number will only be kept until data collection is completed and then will be destroyed. By taking this protective measure, participants data will be able to be reviewed without participant identity being recognized. Age, gender, ethnicity, weight, body mass index (BMI), hemoglobin A1C (HbA1c), and questionnaire results will be collected. Participant data will be identifiable with a number to evaluate HbA1C, weight, BMI, and questionnaire results pre and post intervention. The participant data in the electronic medical record Practice Fusion will be protected with a password and the participant data on the Co-Principal Investigator's personal computer is protected with a password in which the Co-Principal Investigator will only have access to. The password on the personal computer will be changed weekly during the data collection time period as an additional safety precaution. Upon completion of the project, closure of the IRB, and final writing of the DNP Project, all data will be destroyed in accordance with Rutgers University guidelines. The hard copy of the



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participants consents and data will be kept in a locked file cabinet in the chair's office at Rutgers University and will be kept for 5 years.

What will happen to my information or biospecimens collected for this DNP Project after the study is over?

Upon completion of the project, closure of the IRB, and final writing of the DNP Project, all data will be destroyed in accordance with Rutgers University guidelines. The hard copy of the participants consents and data will be kept in a locked file cabinet in the chair's office at Rutgers University and will be kept for 5 years.

There are no other plans for the University to provide other forms of compensation (such as lost wages) to you for study related illnesses or injuries. However, by signing this form, you are not giving up any legal rights to seek further compensation.

What will happen if I do not wish to take part in the study or if I later decide not to stay in the study?

It is your choice whether to take part in the study. You may choose to take part, not to take part or you may change your mind and withdraw from the study at any time. If you do not want to enter the study or decide to stop taking part, your relationship with the study staff will not change, and you may do so without penalty and without loss of benefits to which you are otherwise entitled. You may also withdraw your consent for the use of data already collected about you, but you must do this in writing to Rosemary Dougherty BSN, RN at [REDACTED]

If you decide to withdraw from the study for any reason, you may be asked to return for at least one additional visit for safety reasons.

Who can I call if I have questions?

If you have questions about taking part in this study or if you feel you may have suffered a study related injury, you can call the study Co-Principal Investigator:

Rosemary Dougherty BSN, RN [REDACTED]

If you have questions about your rights as a study subject, you can call the IRB Director at:
Newark Health Science (973)-972-3608

PERMISSION (Authorization) TO USE OR SHARE HEALTH INFORMATION THAT IDENTIFIES YOU FOR A QUALITY IMPROVEMENT STUDY

The next few paragraphs tell you about how investigators want to use and share identifiable health information from your medical record in this study. Your information will only be used as described here or as allowed or required by law. If you sign this consent form, you agree to let the investigators use your identifiable health information in the study and share it with others as described below. Ask questions if there is something you do not understand.



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What is the purpose of the quality improvement study and how will my information be used?

You are being invited to take part in this study which is described at the beginning of this form. The purpose of collecting and using your health information for this study is to help investigators answer the questions that are being asked in the study.

What information about me will be used?

- Demographical information
- Age
- Gender
- Ethnicity
- Weight
- Body Mass Index (BMI)
- Hemoglobin A1C (HbA1c)
- Questionnaire Results
- Medical history or treatment
- Medications
- Laboratory/diagnostic tests

Who may use, share or receive my information?

The study team may use or share your information collected or created for this study with the following people and institutions:

- Rutgers University investigators involved in the study
- The Rutgers University Institutional Review Board and Compliance Boards
- The Office for Human Research Protections in the U.S. Dept. of Health and Human Services

Those persons or organizations that receive your information may not be required by Federal privacy laws to protect it and may share your information with others without your permission, if permitted by the laws governing them.

Will I be able to review my study records while the study is ongoing?

No. We are not able to share information in the study records with you until the study is over. To ask for this information, please contact the Co-Principal Investigator, the person in charge of this study.

Do I have to give my permission?

No. You do not have to permit use of your information. But, if you do not give permission, you cannot take part in this study. (Saying no does not stop you from getting medical care or other benefits you are eligible for outside of this study.)

If I say yes now, can I change my mind and take away my permission later?

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Yes. You may change your mind and not allow the continued use of your information (and to stop taking part in the study) at any time. If you take away permission, your information will no longer be used or shared in the study, but we will not be able to take back information that has already been used or shared with others. If you say yes now but change your mind later for use of your information in the study, you must write to the Co-Principal Investigator and tell him or her of your decision: Rosemary Dougherty BSN, RN [REDACTED]

How long will my permission last?

Your permission for the use and sharing of your health information will last until the end of the study approximately May, 2020.

AGREEMENT TO PARTICIPATE**1. Subject consent:**

I have read this entire consent form, or it has been read to me, and I believe that I understand what has been discussed. All of my questions about this form and this study have been answered. I agree to take part in this study.

Subject Name: _____

Subject Signature: _____ Date: _____

2. Signature of Investigator/Individual Obtaining Consent:

To the best of my ability, I have explained and discussed all the important details about the study including all of the information contained in this consent form.

Investigator/Person Obtaining Consent (printed name): _____

Signature: _____ Date: _____

Appendix E

Diabetes Prevention Educational PowerPoint Intervention



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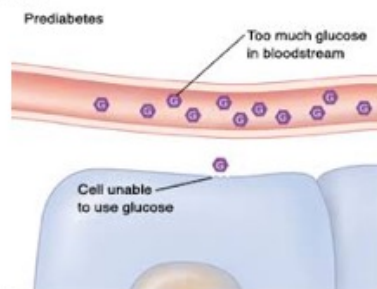
Diabetes Prevention Program

Rosemary Dougherty RN, BSN
Student Nurse Practitioner

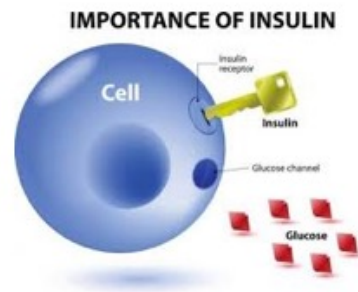


What is Prediabetes?

- **Prediabetes** means that your blood sugar is higher than normal, but it is not high enough to be diagnosed as Type 2 Diabetes Mellitus.
 - After a meal, the body breaks down food into glucose (a type of sugar). A hormone called Insulin which acts like a key to allow glucose (a type of sugar) into the body's cells and can be used for energy. In **Prediabetes**, the body's cells does not make or use Insulin well. The body becomes more and more resistant to Insulin. So glucose (a type of sugar) builds up in the blood instead of going into the cells which causes **Prediabetes** and can eventually progresses to Type 2 Diabetes Mellitus.



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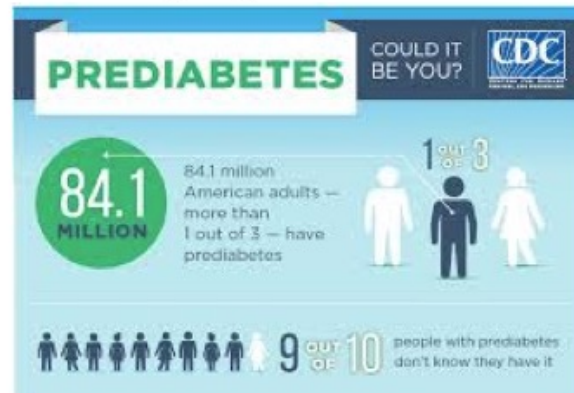


(CDC, 2019, Google Images, 2019)



Prediabetes

- Approximately **84** Million Americans have **Prediabetes**.
- More than **1** in **3** American Adults has **Prediabetes**.
- **9** out of **10** people with **Prediabetes** do not know they have it.
- If you have **Prediabetes** you are more likely to get:
 - Heart attack
 - Stroke
 - Blindness
 - Kidney failure
 - Loss of toes, feet, or legs



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(CDC, 2019; Google Images, 2019)



Who is at Risk?

If you have these Risk Factors you may be at a Higher Risk than Others

- You are overweight.
- You are 45 years of age or older.
- Your parent or sibling has type 2 diabetes.
- You are physically active fewer than 3 times per week.
- You ever gave birth to a baby that weighed more than 9 pounds.
- You ever had diabetes while pregnant (gestational diabetes).
- You have Polycystic Ovary Syndrome

Race and Ethnicity are also factors

- African Americans
- Hispanic/Latino Americans
- American Indians
- Pacific Islanders
- Asian Americans



DID YOU KNOW...

African Americans, Hispanic/Latino Americans, American Indians/Alaska Natives, Pacific Islanders, and some Asian Americans are at higher risk.

If you have any of the risk factors, ask your doctor about getting your blood sugar tested.



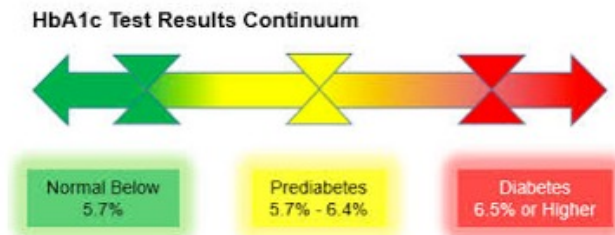
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(CDC, 2019; Google Images, 2019; Watson, 2017)



Screening and Diagnosis of Prediabetes

- Screening for **Prediabetes** and Type 2 Diabetes Mellitus is completed with a simple blood test called the Hemoglobin A1C (HbA1c).
- HbA1c measures the average blood glucose levels over the past 3 months
- Normal HbA1c Level:
 - Below 5.7%
- **Prediabetes** HbA1c Level:
 - **5.7%-6.4%**
- Type 2 Diabetes Mellitus HbA1c Level:
 - Higher than 6.5%



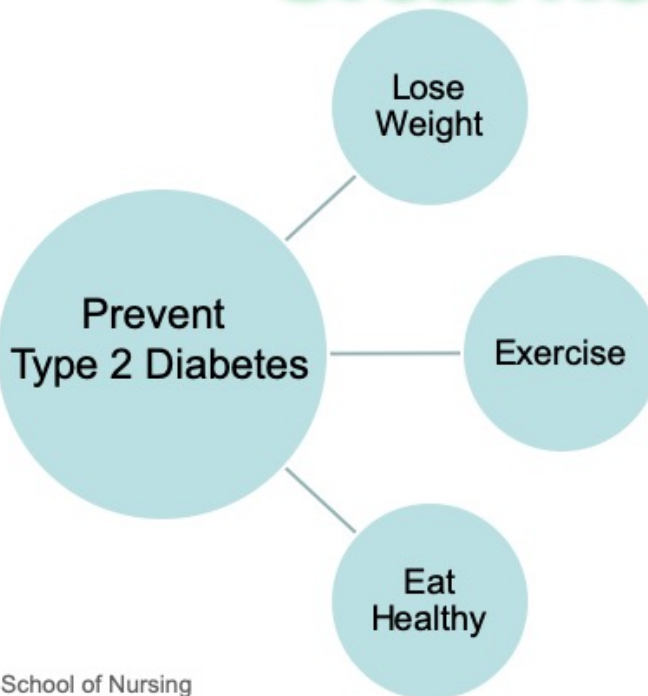
Prediabetes
5.7%-6.4%

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(CDC, 2019; Google Images, 2019)



Great News!



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One of the Most Effective Ways to Reverse **Prediabetes** and Prevent Type 2 Diabetes is by Modifying your Lifestyle by:

- ✓ Losing Weight
- ✓ Increasing Physical Activity
- ✓ Eating Healthy



(CDC, 2019; Google Images, 2019)



Lose Weight

The **Risk** for developing Type 2 Diabetes Mellitus is **cut in half** with a weight reduction of **5%** to **7%** of body weight, which could be as little as **10** to **14** pounds for a 200-pound adult.

GOALS

✂ Lose **5%-7%** of body weight = Type 2 Diabetes Risk Cut in **1/2** ✂

Eating Healthy + Exercise = Weight Loss



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(CDC, 2019; Google Images, 2019)



Eating Healthy

A Diet for Prediabetic and Diabetics is a healthy diet for mostly everyone

- ✓ Eat more Vegetables, Fruits, Protein, and Whole Grains.
- ✓ Keep Meat, Chicken, Turkey, and Fish portions to about 3 ounces.
- ✓ Cut back on High-Fat Foods like Whole Milk, Cheese, and Fried Foods. This will help you reduce the amount of fat and calories you eat each day.
- ✓ Reduce Portion sizes. Eat smaller portions such as 3 ounce hamburger instead of a 6 ounce hamburger.
 - ✓ 3 ounces is about the size of your fist or a deck of cards.
- ✓ Fill your Plate with **¼ Protein**, **½ Vegetables** and **Fruit**, **¼ Grains**.
- ✓ Choose foods with little or no added sugar to reduce calories.
- ✓ Bake or Broil Meat, Chicken, and Fish.



Eating Healthy

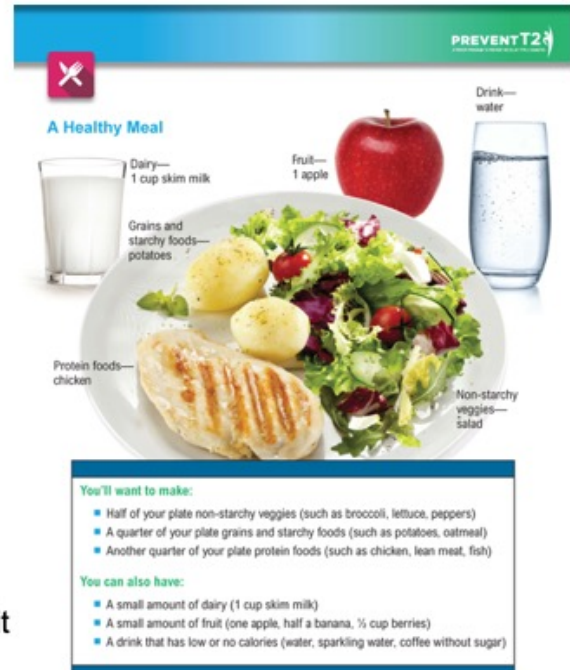
Choose items that are:

- ✓ Low in calories, fat, and sugar
- ✓ High in fiber and water
- ✓ High in vitamins, minerals, and protein
 - ✓ Fruit such as apples, apricots, blueberries, oranges ✓

Limit items that are:

- ✗ High in calories, fat, and sugar
 - Fatty foods such as butter, creamy salad dress, and bacon ✗
- ✗ Low in fiber and water
- ✗ Low in vitamins, minerals, and protein
- ✗ Avoid Fruit Juices or Unsweetened Fruit Juices

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Participant Guide: Eat Well to Prevent T2

3

(CDC, 2019)



Eating Healthy

Eating Well away from Home

- ✓ **Eat** at place with a salad bar, sit down restaurants, and vegetarian restaurants.
- ✗ **Avoid** all-you-can-eat buffets, burger restaurants, fast food, and pizza restaurants.
- ✓ On Menus, look for the **WORDS**:
 - ✓ Baked, Broiled, Diet, Grilled, Healthy, Light, Low-Fat or Fat-Free, Steamed, Vegetable Oil, Whole Grain, Whole Wheat.
- ✓ Have a healthy snack at home before social events. This will help you make healthy choices.
 - ✓ **Ask** for the Smallest Size of Item
 - ✓ **Ask** for an Appetize instead of a Main Course
 - ✓ **Ask** if your Friend can Share your Meal
 - ✓ **Ask** for a To-Go Box when they Bring your Meal so you can Box Up Half of the Meal **Before** Eating.



Foods to Eat

Non-Starchy Vegetables

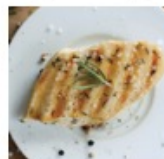
- ✓ Asparagus
- ✓ Broccoli
- ✓ Cabbage
- ✓ Carrots
- ✓ Celery
- ✓ Cucumbers
- ✓ Leafy Greens
- ✓ Mushrooms
- ✓ Onions
- ✓ Peppers
- ✓ Tomatoes



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Protein

- ✓ Eggs
- ✓ Fish and Seafood
(Catfish, Cod, Shrimp)
- ✓ Lean Meat
(Lean Ground Beef, Chicken, Turkey, Pork)
- ✓ Nuts
(limit because high in fat)



Grains & Starchy Foods

- ✓ 100% Corn Tortillas
- ✓ 100% Whole Grain Cereal
- ✓ 100% Whole Wheat Bread
- ✓ Black Beans
- ✓ Brown Rice
- ✓ Corn
- ✓ Green Peas
- ✓ Lentils
- ✓ Oatmeal
- ✓ Popcorn
- ✓ Potatoes
- ✓ Pumpkin
- ✓ Yams



(CDC, 2019; Google Images, 2019)



Foods to Eat

Fruit

- ✓ Apples
- ✓ Apricots
- ✓ Blueberries
- ✓ Dates
- ✓ Grapefruit
- ✓ Grapes
- ✓ Oranges
- ✓ Strawberries



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Dairy

- ✓ Skim or Low-Fat Milk (1 Cup Skim Milk)
- ✓ Plain Nonfat or Low-Fat Yogurt
- ✓ Low-Fat Cheese
- ✓ Plain Low-Fat Soy or Almond Milk



(CDC, 2019; Google Images, 2019)

Drinks

- ✓ Coffee without Sugar
- ✓ Sparkling Water
- ✓ Tea without Sugar
- ✓ Water





Tips for Eat Healthy

- ✓ Drink a large glass of water 10 minutes before your meal
- ✓ Use teaspoons, salad forks, and knives to help you take smaller bites
- ✓ Make less food look like more by serving your meal on a salad or breakfast plate
- ✓ Eat slowly. It takes 20 minutes for your stomach to send a signal to your brain that you are full
- ✓ Snack on Vegetables instead of Chips
- ✓ Buy mixed vegetables when you go food shopping
- ✓ Order a side salad instead of French Fries
- ✓ Make a list of food before you go food shopping
- ✓ Choose food lower in Saturated Fats, *Trans* Fats, Cholesterol , Calories, Salt and Added Sugar

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(CDC, 2019)



Exercise

Adults need to do two types of physical activity each week to improve health

Aerobic & Muscle-Strengthening Activities

150 Minutes of Moderate-Intensity Aerobic Exercise Per Week and Muscle Strengthening 2 Times Per Week Can Help You Lose Weight, Reverse Prediabetes, and Prevent Type 2 Diabetes Mellitus.



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(CDC, 2019; Mass.gov, 2019)



Exercise

Moderate Intensity Aerobic Activity

2 Hours and 30 Minutes (150 minutes) Each Week

OR

Vigorous-Intensity Aerobic Activity

1 Hour and 15 Minutes (75 minutes) Each Week

At Least 10 Minutes a Day



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Muscle Strengthening Activities

2 or More Days Each Week

Repeated 8-12 Times Per Set



(CDC, 2019; Google Images, 2019)



Types of Exercise

Moderate Intensity Aerobic Activity

- ✓ Brisk walking
- ✓ Water aerobics
- ✓ Bicycle riding
- ✓ Tennis (doubles)
- ✓ Ballroom dancing
- ✓ General gardening



Vigorous-Intensity Aerobic Activity

- ✓ Race walking, jogging, or running
- ✓ Swimming laps
- ✓ Tennis (singles)
- ✓ Aerobic dancing
- ✓ Bicycling 10 miles per hour or faster
- ✓ Jumping rope
- ✓ Heavy gardening
- ✓ Hiking uphill or with a heavy backpack

Muscle Strengthening Activities

- ✓ Lifting weights
- ✓ Working with resistance bands
- ✓ Use body weight for resistance
- ✓ Push-Ups
- ✓ Sit-Ups



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(CDC, 2019; Google Images, 2019)



Tips for Exercise

Ways to Get Active

- ✓ Dance to your favorite music
- ✓ Pace the sidelines at your children's or grandchildren's sports events
- ✓ Play actively with your children or pets for 15 to 30 minutes a day.
- ✓ Replace Sunday drives with Sunday walks
- ✓ Run or walk fast when you do errands
- ✓ Start a new active hobby, such as biking or hiking
- ✓ Take a walk after dinner with your family or by yourself
- ✓ Track your steps with a pedometer. Work up to 10,000 steps or more a day
- ✓ Walk around whenever you talk on the phone
- ✓ Walk briskly when you shop
- ✓ Walk up and down escalators instead of just riding them
- ✓ When you watch stand up and move during the ads, or do chores

To Fit Fitness in Anytime

- ✓ Break your 150 minutes into smaller chunks
- ✓ Park your car farther away from the place you want to go
- ✓ Get off the bus or train one stop early and walk the rest of the way
- ✓ Take stairs instead of elevator
- ✓ Use a Fitness app to track your steps and exercise

To Fit Fitness at Home

- ✓ Walk your dog briskly each day
- ✓ Sweep or Mop your Floors Briskly
- ✓ Wash your Car briskly
- ✓ Stretchy, do sit-ups, or pedal a stationary bike while watching TV
- ✓ Mow your lawn with a push mower
- ✓ Plant and care for a garden

Make Sure you Exercise on the Weekend!

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(CDC, 2019)



Tips for Exercise

FREE Exercise Tips

Be active with your kids

Dress for Exercise

Walk outside

Workout at home

Workout with a friend

Look for free fitness classes at
community center

Work out anytime you have the energy

Keep trying new things until you find
something you like

BE CREATIVE!

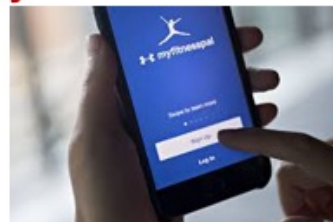


Track your Progress

Use the Happy & Free Food Diary Journal



- ✓ Track Daily Food Intake
- ✓ Track Daily Exercise/Activity
 - ✓ Track Water Intake
 - ✓ Track Cravings
 - ✓ Track Sleep Time
 - ✓ Track Habits
- ✓ Track How you Feel
- ✓ Track Goals



Tracking your Progress will provide motivation, encourage adherence to healthy diet, and assist in weight loss

Use the MyFitnessPal App on your smartphone



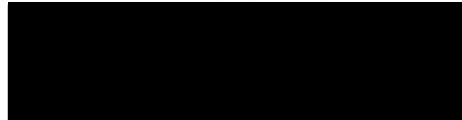
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**Thank You so Much for
Participating!**

If you have any questions contact:

Rosemary Dougherty, RN, BSN

Student Nurse Practitioner





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Appendix F

Educational Material

ENGLISH

Choose More than 50 Ways to Prevent Type 2 Diabetes

Learn how to prevent or delay type 2 diabetes by losing a small amount of weight. To get started, use these tips to help you move more, make healthy food choices, and track your progress.

Reduce Portion Sizes

Portion size is the amount of food you eat, such as 1 cup of fruit or 6 ounces of meat. If you are trying to eat smaller portions, eat a half of a bagel instead of a whole bagel or have a 3-ounce hamburger instead of a 6-ounce hamburger. Three ounces is about the size of your fist or a deck of cards.



Put less on your plate, Nate.

1. Drink a large glass of water 10 minutes before your meal so you feel less hungry.
2. Keep meat, chicken, turkey, and fish portions to about 3 ounces.
3. Share one dessert.



Eat a small meal, Lucille.

4. Use teaspoons, salad forks, or child-size forks, spoons, and knives to help you take smaller bites and eat less.
5. Make less food look like more by serving your meal on a salad or breakfast plate.
6. Eat slowly. It takes 20 minutes for your stomach to send a signal to your brain that you are full.
7. Listen to music while you eat instead of watching TV (people tend to eat more while watching TV).

How much should I eat?

Try filling your plate like this:



NDEP National Diabetes Education Program

A program of the National Institutes of Health and the Centers for Disease Control and Prevention

Move More Each Day

Find ways to be more active each day. Try to be active for at least 30 minutes, 5 days a week. Walking is a great way to get started and you can do it almost anywhere at any time. Bike riding, swimming, and dancing are also good ways to move more.

If you are looking for a safe place to be active, contact your local parks department or health department to ask about walking maps, community centers, and nearby parks.



Dance it away, Faye.

8. Show your kids the dances you used to do when you were their age.

9. Turn up the music and jam while doing household chores.

10. Work out with a video that shows you how to get active.

Let's go, Flo.

11. Deliver a message in person to a co-worker instead of sending an e-mail.

12. Take the stairs to your office. Or take the stairs as far as you can, and then take the elevator the rest of the way.

13. Catch up with friends during a walk instead of by phone.

14. March in place while you watch TV.

15. Choose a place to walk that is safe, such as your local mall.

16. Get off of the bus one stop early and walk the rest of the way home or to work if it is safe.

Make Healthy Food Choices

Find ways to make healthy food choices. This can help you manage your weight and lower your chances of getting type 2 diabetes.

Choose to eat more vegetables, fruits, and whole grains. Cut back on high-fat foods like whole milk, cheeses, and fried foods. This will help you reduce the amount of fat and calories you take in each day.

Snack on a veggie, Reggie.

17. Buy a mix of vegetables when you go food shopping.

18. Choose veggie toppings like spinach, broccoli, and peppers for your pizza.

19. Try eating foods from other countries. Many of these dishes have more vegetables, whole grains, and beans.

20. Buy frozen and low-salt (sodium) canned vegetables. They may cost less and keep longer than fresh ones.

21. Serve your favorite vegetable and a salad with low-fat macaroni and cheese.





Cook with care, Claire.

22. Stir fry, broil, or bake with non-stick spray or low-salt broth. Cook with less oil and butter.

23. Try not to snack while cooking or cleaning the kitchen.

24. Cook with smaller amounts of cured meats (smoked turkey and turkey bacon). They are high in salt.

Cook in style, Kyle.

25. Cook with a mix of spices instead of salt.

26. Try different recipes for baking or broiling meat, chicken, and fish.

27. Choose foods with little or no added sugar to reduce calories.

28. Choose brown rice instead of white rice.



Eat healthy on the go, Jo.

29. Have a big vegetable salad with low-calorie salad dressing when eating out. Share your main dish with a friend or have the other half wrapped to go.

30. Make healthy choices at fast food restaurants. Try grilled chicken (with skin removed) instead of a cheeseburger.

31. Skip the fries and chips and choose a salad.

32. Order a fruit salad instead of ice cream or cake.



Rethink your drink, Linc.

33. Find a water bottle you really like (from a church or club event, favorite sports team, etc.) and drink water from it every day.

34. Peel and eat an orange instead of drinking orange juice.



35. If you drink whole milk, try changing to 2% milk. It has less fat than whole milk. Once you get used to 2% milk, try 1% or fat-free (skim) milk. This will help you reduce the amount of fat and calories you take in each day.

36. Drink water instead of juice and regular soda.

Eat smart, Bart.

37. Make at least half of your grains whole grains, such as whole grain breads and cereals, brown rice, and quinoa.

38. Use whole grain bread for toast and sandwiches.

39. Keep a healthy snack with you, such as fresh fruit, a handful of nuts, and whole grain crackers.

40. Slow down at snack time.

Eating a bag of low-fat popcorn takes longer than eating a candy bar.

41. Share a bowl of fruit with family and friends.

42. Eat a healthy snack or meal before shopping for food. Do not shop on an empty stomach.

43. Shop at your local farmers market for fresh, local food.

Keep track, Jack.

44. Make a list of food you need to buy before you go to the store.

45. Keep a written record of what you eat for a week. It can help you see when you tend to overeat or eat foods high in fat or calories.

Read the label, Mabel.

46. Compare food labels on packages.

47. Choose foods lower in saturated fats, *trans* fats, cholesterol (ko-LESS-tuh-ruhl), calories, salt, and added sugars.



Take Care of Your Mind, Body, and Soul



You can exhale, Gail.

48. Take time to change the way you eat and get active. Try one new food or activity a week.

49. Find ways to relax. Try deep breathing, taking a walk, or listening to your favorite music.

50. Pamper yourself. Read a book, take a long bath, or meditate.

51. Think before you eat. Try not to eat when you are bored, upset, or unhappy.

Be Creative

Honor your health as your most precious gift. There are many more ways to prevent or delay type 2 diabetes by making healthy food choices and moving more. Discover your own and share them with your family, friends, and neighbors.

Make up your own, Tyrone or Simone.

52. _____

53. _____

54. _____

Track Your Progress

Visit www.ndep.nih.gov or call 1-800-860-8747 / TTY: 1-866-569-1162 to get your free GAME PLAN to Prevent Type 2 Diabetes booklet. It has charts to help you track the foods you eat and how much you move each day.



Things to Remember:

- Talk to your doctor about your risk for getting type 2 diabetes and what you can do to lower your chances.
- Take steps to prevent diabetes by making healthy food choices, staying at a healthy weight, and moving more every day.
- Find ways to stay calm during your day. Being active and reading a good book can help you lower stress.
- Keep track of the many ways you are moving more and eating healthy by writing them down.

National Diabetes Education Program
1-800-860-8747
www.ndep.nih.gov

The NIDDK would like to thank: Janet O. Brown-Friday, RN, MSN, MPH, Clinical Trials Manager, Diabetes Clinical Trials Unit, Albert Einstein College of Medicine.

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September 2014
NIH Publication No. 12-5487
NDEP-71

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Participant Guide

Eat Well to Prevent T2

PREVENT T2 
A PROVEN PROGRAM TO PREVENT OR DELAY TYPE 2 DIABETES



Session Focus

Eating well can help you prevent or delay type 2 diabetes.

This session we will talk about:

- How to eat well
- How to build a healthy meal
- The items in each food group

You will also make a new action plan!



Tips:

- ✓ Use herbs, spices, lemon juice, and low-fat dressing to make veggies taste better.
- ✓ Fill up on fiber and water.
- ✓ Shop, cook, and eat healthy with friends and family.

Key points to remember:

Choose items that are:

- Low in calories, fat, and sugar
- High in fiber and water
- High in vitamins, minerals, and protein

Limit items that are:

- High in calories, fat, and sugar
- Low in fiber and water
- Low in vitamins, minerals, and protein





A Healthy Meal



Dairy—
1 cup skim milk

Fruit—
1 apple



Drink—
water



Grains and
starchy foods—
potatoes

Protein foods—
chicken



Non-starchy
veggies—
salad

You'll want to make:

- Half of your plate non-starchy veggies (such as broccoli, lettuce, peppers)
- A quarter of your plate grains and starchy foods (such as potatoes, oatmeal)
- Another quarter of your plate protein foods (such as chicken, lean meat, fish)

You can also have:

- A small amount of dairy (1 cup skim milk)
- A small amount of fruit (one apple, half a banana, ½ cup berries)
- A drink that has low or no calories (water, sparkling water, coffee without sugar)



Make Your Plate

Write the number of the correct food group on each line.
Then create a healthy meal by listing items that you like. You can use "Foods to Choose" on pages 5-7 for ideas.

Food Groups

1. Non-starchy veggies
2. Grains and starchy foods
3. Protein foods
4. Dairy foods
5. Fruit
6. Drink





Foods to Choose

Non-starchy veggies:

- Asparagus
- Broccoli
- Cabbage
- Carrots
- Celery
- Cucumbers
- Leafy greens
- Mushrooms
- Onions
- Peppers
- Tomatoes
- Your favorites:



Grains and starchy foods:

- 100% corn tortillas
- 100% whole grain cereal
- 100% whole wheat bread
- Black beans
- Brown rice
- Corn
- Green peas
- Lentils
- Oatmeal
- Popcorn
- Potatoes
- Pumpkin
- Yams
- Your favorites:



Sources: CDC, ADA



Foods to Choose

Protein foods:

- Eggs (but limit yolks)
- Fish and seafood (catfish, cod, shrimp)
- Lean meat (lean ground beef, chicken and turkey without skin, pork loin)
- Nuts (limit because high in fat)
- Your favorites:



Dairy foods:

- Low-fat cheese
- Plain low-fat soy or almond milk
- Plain nonfat or low-fat yogurt
- Skim or low-fat milk
- Your favorites:



Sources: CDC, ADA



Foods to Choose

Fruit:

- Apples
- Apricots
- Blueberries
- Dates
- Grapefruit
- Grapes
- Oranges
- Strawberries
- Your favorites:



Drinks:

- Coffee without sugar
- Sparkling water
- Tea without sugar
- Water
- Your favorites:



Sources: CDC, ADA

Foods to Limit

Sweet foods:

- Candy
- Cookies
- Corn syrup
- Honey
- Ice cream
- Molasses
- Processed snack foods
- Sugar
- Other examples:



Fatty foods:

- Butter
- Creamy salad dressing
- Deep fried foods (French fries)
- Fatty meat (bacon, bologna, regular ground beef)
- Full-fat cheese
- Lard
- Shortening
- Whole milk
- Other examples:



Sources: CDC, ADA



It can be challenging to shop, cook, and eat well. Here are some common challenges and ways to cope with them. Write your own ideas in the column that says “Other Ways to Cope.” Check off each idea you try.

[illegible]



How to Cope with Challenges

Challenge	Ways to Cope	Other Ways to Cope
I don't like the way this food tastes.	<input type="checkbox"/> Change your favorite dishes to make them healthier. <input type="checkbox"/> Choose cheeses that are strong-tasting and fairly low in fat, such as Parmesan and feta. <input type="checkbox"/> Choose good quality items. <input type="checkbox"/> Choose items with a variety of flavors, textures, scents, and colors. <input type="checkbox"/> Cook veggies like green beans and broccoli lightly, so they stay crisp and colorful. <input type="checkbox"/> Dress up food with herbs, spices, low-fat salad dressing, lemon juice, vinegar, hot sauce, plain nonfat yogurt, and salsa. <input type="checkbox"/> Grill or roast veggies and meat to bring out the flavor.	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
It's unpleasant/boring/hard to shop, cook, and eat this way.	<input type="checkbox"/> Shop, cook, and eat healthy with friends and family. <input type="checkbox"/> Learn new cooking methods and recipes from books, articles, and videos. Or take a healthy cooking class. <input type="checkbox"/> Try new ingredients.	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____



Participant Guide

Eat Well Away from Home

PREVENT2 
A PROVEN PROGRAM TO PREVENT OR DELAY TYPE 2 DIABETES



Session Focus

Eating well away from home can help prevent or delay type 2 diabetes.

This session we will talk about:

- Some challenges of eating well at restaurants and social events
- How to plan for and cope with these challenges

You will also make a new action plan!



Tips:

- ✓ Ask questions about ingredients and how food was prepared.
- ✓ Have a healthy snack at home before social events. This will help you make healthy choices.





José's Story

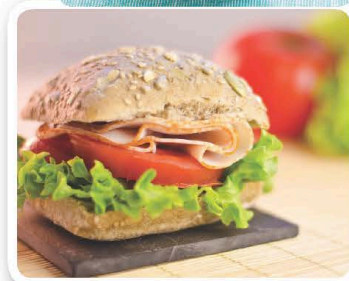
José's doctor tells him that he's at risk for type 2 diabetes. So he needs to change the way he eats. José has a healthy breakfast and dinner at home each day. But lunches are another story.

José is a building contractor. During the day, he's always on the go from one job site to another. He gets his lunch at a fast-food drive-thru. He usually has a burger, fries, and soda.

José loves getting together with his family. But he finds it hard to eat well at these events. He has trouble finding healthy choices. And his mother always pushes her empanadas on him. He doesn't want to hurt her feelings, so he takes just one.



José decides to make better choices when he eats away from home. He tries to pack a healthy lunch the night before. If he buys his lunch, he orders a turkey sandwich with a side salad. Instead of drinking soda, he now drinks water. José is also getting better at saying, "No, thank you" to his mother's empanadas.





Eat Well at Restaurants

You are more likely to find healthy choices at:

- Places with a salad bar
- Sit-down restaurants
- Vegetarian restaurants

You are less likely to find healthy choices at:

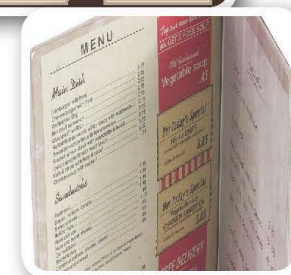
- All-you-can-eat buffets
- Burger restaurants
- Most fast-food restaurants
- Pizza restaurants

On menus, look for the words:

- Baked
- Broiled
- Diet
- Grilled
- Healthy
- Light
- Low-fat or fat-free
- Steamed
- Vegetable oil
- Whole grain or whole wheat

To find out if an item is healthy, ask:

- How is this made?
- What ingredients are in this?
- What kind of oil is this cooked in?





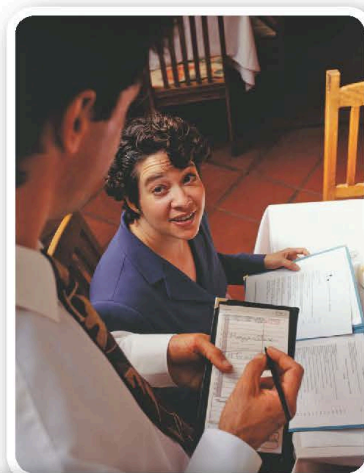
Eat Well at Restaurants

To make a healthy swap, ask:

- Can I have this baked/steamed/broiled/grilled instead of fried?
- Can I have extra veggies on my sandwich instead of cheese?
- Can I have the dressing/sauce/gravy/sour cream/butter on the side?
- Can I have a baked potato instead of fries?
- Can I have a salad instead of coleslaw?
- Can this be cooked in vegetable oil instead of lard/butter?
- Can I have some fruit instead of dessert?
- Can the fat be trimmed from the meat before it's cooked?
- Can the skin be removed from the chicken before it's cooked?
- Can I have skim milk with my coffee instead of half-and-half?
- Can I have water with lemon instead of soda?

To make sure you get a healthy amount, ask:

- Can I get the smallest size of this item?
- Can I have an appetizer instead of a main course?
- Can my friend and I share this item?
- Can I get a to-go box when you bring my meal? (Then you can box up half of it before you start eating!)





Eat Well at Social Events

To prepare for social events:


- Have a healthy snack at home so you won't be too hungry. This will help you make healthy choices at the event.
- Tell the hosts about your eating plan. Tell them you are eating this way to prevent type 2 diabetes. Ask them to support your efforts.
- Suggest some healthy choices.
- Ask if you can bring something healthy.
- Practice saying, "No, thank you."



To eat well during social events:





- Allow yourself a small treat.
- Ask about ingredients and how dishes were prepared.
- Eat the healthy dish you brought.
- Fill up on non-starchy veggies or a broth-based soup.
- Keep a glass of water in your hand.
- Limit alcohol.
- Say, "No, thank you."
- Stay away from the buffet.
- Tell other guests about your eating plan, and why you are following it.




ADULTS

What's your move?

You know you need physical activity to stay healthy.
But did you know it can help you feel better right away?


 Boost your mood
  Sharpen your focus
  Reduce your stress
  Improve your sleep






So get more active — and start feeling better today.

How much activity do I need?

Moderate-intensity aerobic activity


Anything that gets your heart beating faster counts.





Muscle-strengthening activity

Do activities that make your muscles work harder than usual.



AND

Tight on time this week? **Start with just 5 minutes.** It all adds up!

Or get the same benefits in half the time. If you step it up to **vigorous-intensity** aerobic activity, aim for at least **75 minutes** a week.

Is it moderate or vigorous? Use the “talk test” to find out.

When you're being active, just try talking:

- If you're breathing hard but can still have a conversation easily, it's **moderate-intensity activity**
- If you can only say a few words before you have to take a breath, it's **vigorous-intensity activity**

What counts?

Whatever gets you moving!



Even things you have to do anyway

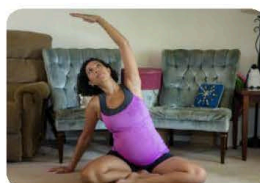


Even things that don't feel like exercise

You can get more active.

No matter who you are, where you live, on your own, or together.

You can find a way that works for you.



And over time, physical activity can help you live a longer, healthier life.

- ✓ Lower your risk of diseases like type 2 diabetes and some cancers
- ✓ Control your blood pressure
- ✓ Stay at a healthy weight

So take the first step. Get a little more active each day. **Move your way.**

Find tips to get moving and build a weekly activity plan.

health.gov/MoveYourWay/Activity-Planner



Downloaded at:

https://health.gov/paguidelines/moveyourway/materials/PAG_MYW_Adult_FS.pdf





OLDER ADULTS

What's your move?

Physical activity can make daily life better.

When you're active and strong, it's easier to:



Do everyday tasks,
like chores and shopping



Keep up with the grandkids



Stay independent
as you get older

And it has big health benefits, too.

✓ Less pain

✓ Better mood

✓ Lower risk of many diseases

How much activity do I need?

Moderate-intensity aerobic activity

Anything that gets your heart beating faster counts.



AND







Break it up over the whole week however you want!

Physical activity can help manage many health problems.

✓ Reduce symptoms of arthritis, anxiety, and depression

✓ Help keep diabetes and high blood pressure under control

Just getting started?

No problem — start slow and do what you can. **Even a 5-minute walk has real health benefits.** Build up to more activity over time.

Mix in stretches and activities to improve your balance, too! Keep your body flexible and help lower your risk of falls.

And all sorts of activities count.



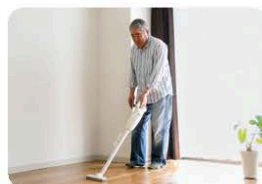
Even things you have to do anyway



Even things that don't feel like exercise

You can get more active.

No matter your age, you can **find a way that works for you.**



So take the first step. Get a little more active each day. **Move your way.**

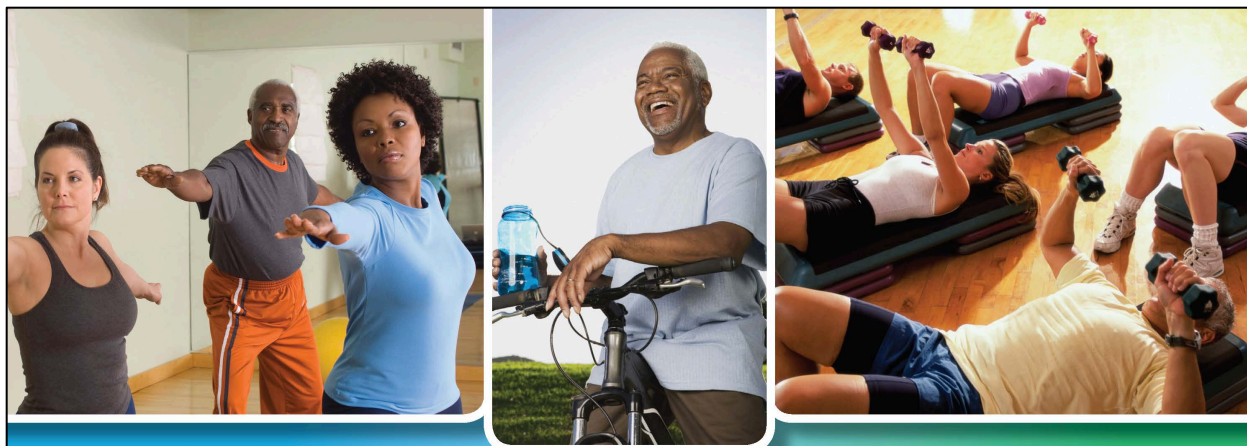
Find tips to get moving and build a weekly activity plan.

health.gov/MoveYourWay/Activity-Planner



Downloaded at:

https://health.gov/paguidelines/moveyourway/materials/PAG_MYW_OlderAdults_FS.pdf



Participant Guide

Get Active to Prevent T2

PREVENT T2 
A PROVEN PROGRAM TO PREVENT OR DELAY TYPE 2 DIABETES



Session Focus

Getting active can help you prevent or delay type 2 diabetes.

This session we will talk about:

- Some benefits of getting active
- Some ways to get active

You will also make a new action plan!



Tips:

- ✓ Try to be a little more active this week.
- ✓ Try lots of different activities. You're sure to find at least one that you enjoy.



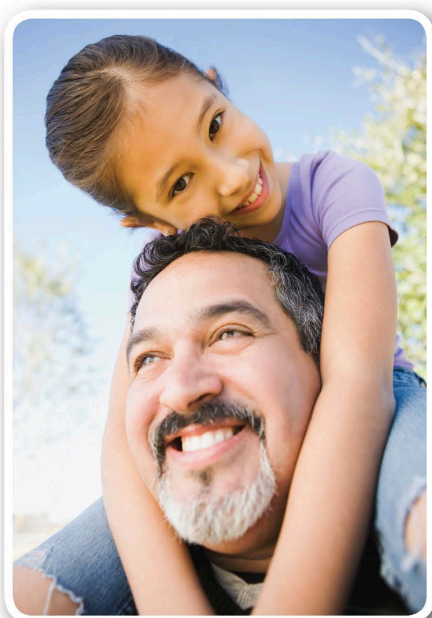


Teo's Story

Teo is at risk for type 2 diabetes. His doctor urges him to lose 20 pounds and work up to at least 150 minutes of activity each week.

Teo and his wife have five children. The kids all play sports, and he spends a lot of time driving them to events.

Teo also works full time. On weekends, he works a second, part-time job. When he has some free time, he likes to watch basketball on TV, but he rarely plays it. He spends a lot of time sitting.



Teo finds some ways to get active:

- He walks on the sidelines during his children's sports events.
- He also walks with a friend during his lunch break each day.
- He plays basketball with his kids instead of watching it on TV.
- He takes the stairs instead of the elevator.

Teo gets more active over time. These days, he's active for at least 150 minutes a week. His weight is going down. And his blood sugar is lower. He sleeps better than ever. Plus, he has more energy than he did before he got active.



Ways to Get Active

There are so many great ways to get active. You're sure to find at least one that you enjoy. Here are just a few ideas.

1. After you read six pages of a book, get up and move a little.
2. Dance to your favorite music.
3. Pace the sidelines at your children's or grandchildren's sports events.
4. Play actively with your children or pets for 15 to 30 minutes a day.
5. Replace Sunday drives with Sunday walks.
6. Run or walk fast when you do errands.
7. Start a new active hobby, such as biking or hiking.
8. Take a walk after dinner with your family or by yourself.
9. Track your steps with a pedometer. Work up to 10,000 steps or more a day.
10. Walk around whenever you talk on the phone.
11. Walk briskly when you shop.
12. Walk up and down escalators instead of just riding them.
13. Walk your dog each day.
14. When you watch TV, stand up and move during the ads, or do chores.

How do you plan to get active?



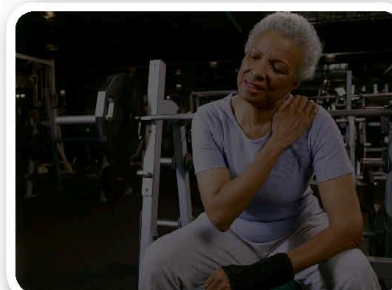
Source: American College of Sports Medicine (<https://www.acsm.org/docs/brochures/reducing-sedentary-behaviors-sitting-less-and-moving-more.pdf>) and Heart Foundation (<https://heartfoundation.org.au/images/uploads/publications/PA-Sitting-Less-Adults.pdf>)



Are You Ready to Get Active?

Check off any statement that is true for you. If you check off one or more items, make sure to see your healthcare provider **BEFORE** you get active.

- ☐ I am over 50, and I haven't been active in a long time. I am planning to be very active.
- ☐ I am pregnant. My healthcare provider hasn't given me the OK to get active.
- ☐ I get very out of breath when I am even slightly active.
- ☐ I have a health problem or other issue not listed here that might need attention if I get active.
- ☐ I have a heart problem. My healthcare provider wants to keep an eye on my activity.
- ☐ I have bone or joint problems that make it hard for me to do things like fast walking.
- ☐ I have chest pain that started within the last month.
- ☐ I tend to pass out or fall down when I get dizzy.
- ☐ During or right after a workout, I often have pain or pressure in my neck, left shoulder, or arm.
- ☐ My healthcare provider wants me to take medicine for high blood pressure or a heart problem.



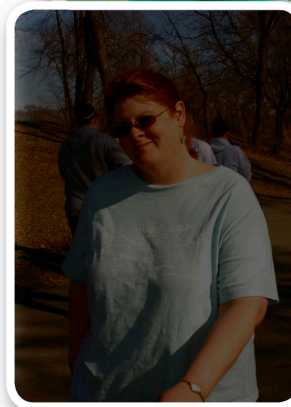
Source: American Heart Association (http://www.heart.org/idc/groups/heart-public/@wcm/@mwa/documents/downloadable/ucm_432990.pdf)



Be Active, Be Safe

If you get hurt, you may need to take a break from being active. So follow these tips to work out safely.

1. Ask your healthcare provider if you are ready to be active. (See “Are You Ready to Get Active?” on page 5.)
2. Dress for the activity. Wear the right shoes and clothes. Use safety gear as needed.
3. Drink water before, during, and after your workout, even if you don't feel thirsty.
4. Listen to your body. Slow down or stop if you feel very tired, sick, or faint, or your joints hurt.
5. Mix it up. Do a variety of activities. That way you won't strain any one part of your body.
6. Start small. If you train too hard or too often, you may get hurt. Try to make slow, steady progress over time.
7. Warm up before you work out. Cool down after you work out. Take 5 to 10 minutes for each.
8. Watch out. Take care not to trip or bump into anything.
9. Work with the weather. Work out indoors if it's too hot or too cold. If you get too hot, you may get a headache or a fast heartbeat. You may feel dizzy, sick to your stomach, or faint.
10. Use good form when strength training.



Source: National Institute of Aging/National Institutes of Health: Staying Safe During Exercise and Physical Activity (<https://go4life.nia.nih.gov/sites/default/files/StayingSafe.pdf>)
Harvard Health Publications (<http://www.health.harvard.edu/healthbeat/10-tips-for-exercising-safely>)



It can be challenging to get active. Here are some common challenges and ways to cope with them. Write your own ideas in the column that says “Other Ways to Cope.” Check off each idea you try.

[illegible]



How to Cope With Challenges

Challenge	Ways to Cope	Other Ways to Cope
I don't have time.	To fit in fitness at work: <ul style="list-style-type: none"> <input type="checkbox"/> Take a brisk walk during your coffee or lunch break. Ask a friend to go with you. <input type="checkbox"/> Take part in an exercise program at work. <input type="checkbox"/> Join a nearby gym. Stop off before or after work, or during your lunch break. <input type="checkbox"/> Join the office softball team or walking group. <input type="checkbox"/> Use a copy machine on the other side of the building. 	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
I don't have child care.	<ul style="list-style-type: none"> <input type="checkbox"/> Be active with your kids. <input type="checkbox"/> Swap child care with a friend. <input type="checkbox"/> Ask friends or family to help out. <input type="checkbox"/> Use gym child care. 	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
I don't have a car.	<ul style="list-style-type: none"> <input type="checkbox"/> Work out in your own home or area. 	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
I feel embarrassed.	<ul style="list-style-type: none"> <input type="checkbox"/> Work out in your own home. <input type="checkbox"/> Work out with a friend. 	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
My area is not safe.	<ul style="list-style-type: none"> <input type="checkbox"/> Work out in your own home. <input type="checkbox"/> Work out at a gym or community center. 	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____



How to Cope With Challenges

Challenge	Ways to Cope	Other Ways to Cope
It costs too much.	<input type="checkbox"/> Do free activities like walking. <input type="checkbox"/> Buy workout clothes and equipment on sale. <input type="checkbox"/> Look for free fitness classes at your library or community center.	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
It's boring.	<input type="checkbox"/> Dance. <input type="checkbox"/> Play with your kids. <input type="checkbox"/> Work out with a friend. <input type="checkbox"/> Use a fitness app. <input type="checkbox"/> Listen to music, watch TV, or talk on the phone while you are active. <input type="checkbox"/> Keep trying new things until you find something you like.	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
It's painful or tiring.	<input type="checkbox"/> Ask your healthcare provider what ways to get active are right for you. <input type="checkbox"/> Work out safely (see next handout). <input type="checkbox"/> Work out at the time of day when you have the most energy. <input type="checkbox"/> Walk slowly or swim. <input type="checkbox"/> Do yoga or Tai Chi.	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____
It messes up my hair.	<input type="checkbox"/> Work out in a cool place. <input type="checkbox"/> Try new hair products and styles.	<input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____ <input type="checkbox"/> _____

Appendix G


Food Diary Journal



(Amazon.com, 2019)

Appendix H

MyFitnessPal Application Description



App Store Preview

This app is only available on the App Store for iOS devices.

MyFitnessPal 4+
Calorie Counter & Diet Tracker
MyFitnessPal.com
#5 in Health & Fitness
4.7, 493.3K Ratings
Free - Offers In-App Purchases

Screenshots iPhone iPad iMessage Apple Watch

Whether you want to lose weight, tone up, get healthy, change your habits, or start a new diet, you'll love MyFitnessPal.

- Consumer Reports #1 rated diet
- PC Magazine Editor's Choice Selection
- #1 Health and Fitness app for 4 years straight

Also featured in the NY Times, Wall Street Journal, Wired, USA Today, Family Circle, Marie Claire, NBC, CNET, Shape, the Today Show and more.

See for yourself why MyFitnessPal is the world's most popular health and fitness app.

TRACKING FOOD IS FAST AND EASY

- Biggest Food Database -- 6+ million foods in our database including global items and cuisines.
- Barcode Scanner -- Simply scan barcodes to log foods. 4+ million barcodes recognized.
- Recipe Importer -- Easily import the nutrition information for the recipes you cook.
- Restaurant Logging -- Quickly log menu items from your favorite restaurants.
- Food Insights -- Learn how to make healthier choices about the foods you eat.
- Personalized Experience -- Create your own foods, recipes, and meals and save favorites.
- Calorie Counter -- We automatically calculate the calories in your foods, meals and recipes.
- Track All Nutrients -- Calories, fat, protein, carbs, sugar, fiber, cholesterol, vitamins, and more.
- Customize Your Diary -- Log breakfast, lunch, dinner and snacks or create your own meals.

Water Tracking -- Log water in cups, ounces or mL. We save your recently logged amounts.

(MyFitnessPal.com, 2009)

Appendix I

Pre/Post Questionnaire



RUTGERS
School of Nursing

Multimedia-Based Diabetes Prevention Program Knowledge

PRE / POST Questionnaire

ID # _____

DATE _____

PRE / POST

DIRECTIONS:

Below are 10 Questions about Prediabetes and Diabetes. Some are true statements and some are false. Please read each statement and then indicate whether you think it is TRUE or FALSE by putting a CIRCLE around either TRUE or FALSE. This questionnaire is to test your knowledge about Prediabetes and Diabetes. Thank you.

1. The diet for prediabetes and diabetes is a healthy diet for most people.	TRUE / FALSE
2. Glycosylated hemoglobin (HbA1c) is a test that measures your average blood sugar in the last three months.	TRUE / FALSE
3. Prediabetes is having a HbA1c between 5.7% to 6.4%.	TRUE / FALSE
4. Exercise has NO benefit in reversing prediabetes and/or preventing type 2 diabetes mellitus.	TRUE / FALSE
5. 150 minutes of moderate-intensity aerobic exercise per week and muscle strengthening 2 times per week can help you lose weight and prevent type 2 diabetes mellitus.	TRUE / FALSE
6. Fatty foods such as butter, creamy salad dressing and bacon are ALLOWED on the diabetes diet.	TRUE / FALSE
7. Fruit such as apples, apricots, blueberries, oranges are ALLOWED on the diabetes diet.	TRUE / FALSE
8. Lung problems are associated with having diabetes.	TRUE / FALSE
9. Unsweetened fruit juices raises blood glucose levels.	TRUE / FALSE
10. Modifying your lifestyle such as diet and exercise lowers your risk of getting type 2 diabetes mellitus.	TRUE / FALSE

Pre/Post Questionnaire Answer Key


RUTGERS

School of Nursing

Multimedia-Based Diabetes Prevention Program Knowledge
PRE / POST Questionnaire

ID # _____

DATE _____

PRE / POST

DIRECTIONS:

Below are 10 Questions about Prediabetes and Diabetes. Some are true statements and some are false. Please read each statement and then indicate whether you think it is TRUE or FALSE by putting a CIRCLE around either TRUE or FALSE. This questionnaire is to test your knowledge about Prediabetes and Diabetes. Thank you.

1. The diet for prediabetes and diabetes is a healthy diet for most people.	TRUE / FALSE
2. Glycosylated hemoglobin (HbA1c) is a test that measures your average blood sugar in the last three months.	TRUE / FALSE
3. Prediabetes is having a HbA1c between 5.7% to 6.4%.	TRUE / FALSE
4. Exercise has NO benefit in reversing prediabetes and/or preventing type 2 diabetes mellitus.	TRUE / FALSE
5. 150 minutes of moderate-intensity aerobic exercise per week and muscle strengthening 2 times per week can help you lose weight and prevent type 2 diabetes mellitus.	TRUE / FALSE
6. Fatty foods such as butter, creamy salad dressing and bacon are ALLOWED on the diabetes diet.	TRUE / FALSE
7. Fruit such as apples, apricots, blueberries, oranges are ALLOWED on the diabetes diet.	TRUE / FALSE
8. Lung problems are associated with having diabetes.	TRUE / FALSE
9. Unsweetened fruit juices raises blood glucose levels.	TRUE / FALSE
10. Modifying your lifestyle such as diet and exercise lowers your risk of getting type 2 diabetes mellitus.	TRUE / FALSE

Appendix J

Project Timeline

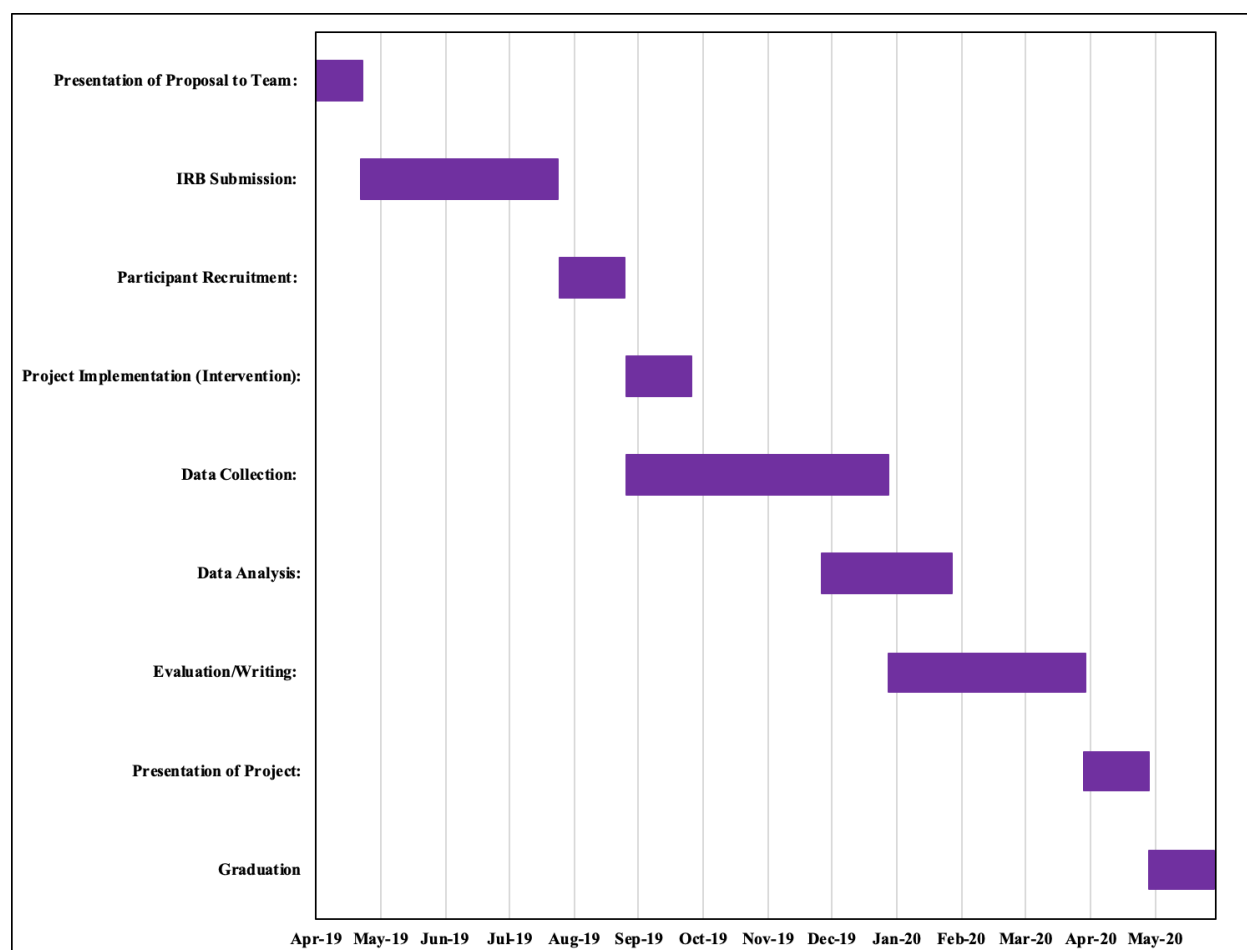


Figure 1 Project Timeline

Appendix K

Project Budget

Expense	Cost	Total Cost
Recruitment Flyers	50 @ \$0.13	\$6.50
Educational Materials	50-100: \$10.58	\$10.58
Food Diary Journal	50 @ \$7.36	\$368.00
SPSS Program	\$89.00	\$89.00
LEARD Statistics Program	\$12.99 (6-month subscription)	\$12.99
Dissemination Posters	\$75.00	\$75.00
Total:		\$562.07

Appendix L

Results

Table 1

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Participant Post Intervention Weight	148.5000	4	16.34013	8.17007
	Participant Pre Intervention Weight	152.5000	4	17.93507	8.96753
Pair 2	Participant Post Intervention BMI	26.7750	4	2.42539	1.21269
	Participant Pre Intervention BMI	27.4750	4	2.68126	1.34063
Pair 3	Participant Post Intervention HbA1c	5.7500	4	.20817	.10408
	Participant Pre Intervention HbA1c	5.9000	4	.20000	.10000
Pair 4	Participant Post Intervention Questionnaire Score	90.0000	4	8.16497	4.08248
	Participant Pre Intervention Questionnaire Score	82.5000	4	12.58306	6.29153

Table 2

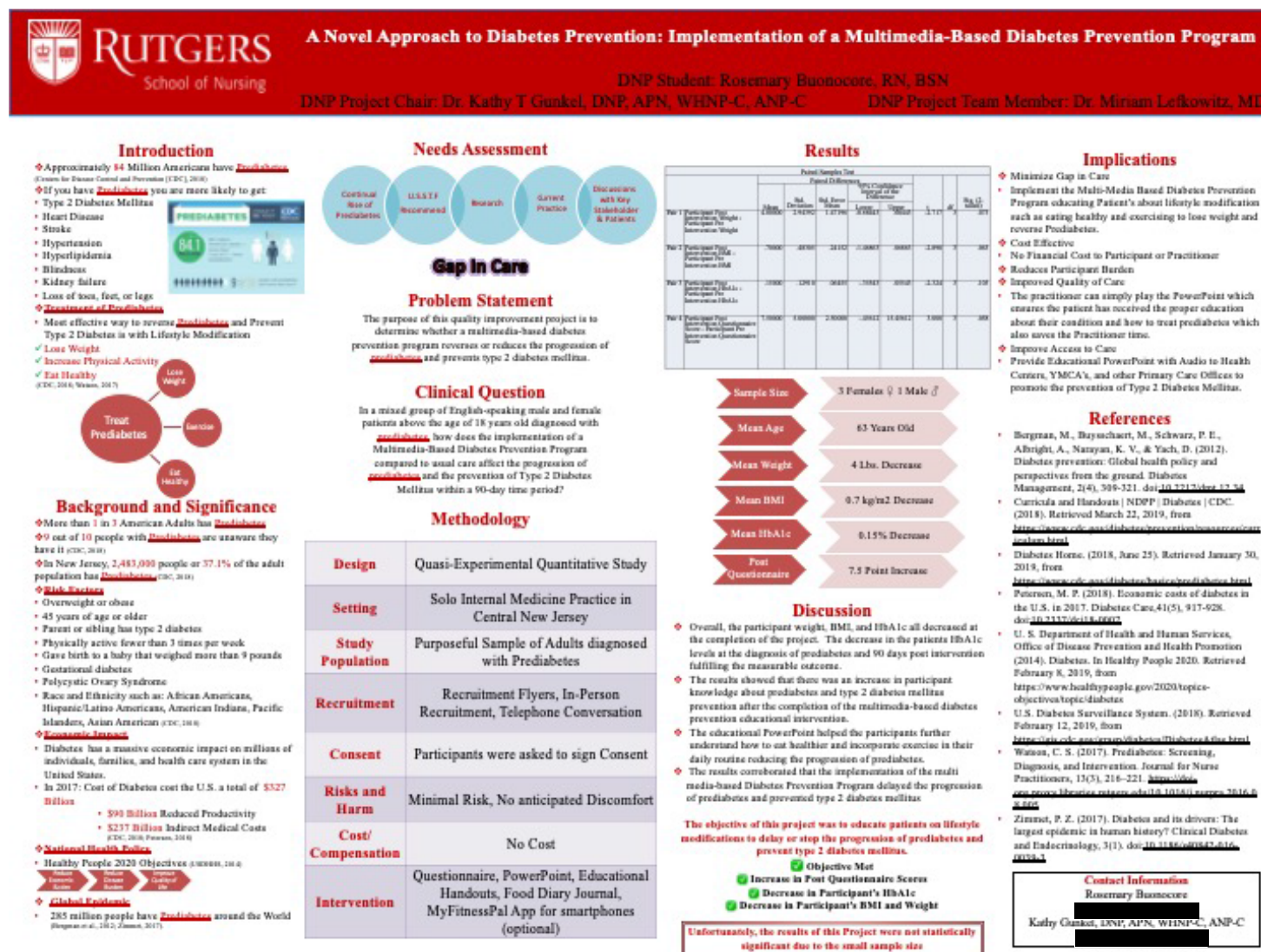
Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	Participant Post Intervention Weight & Participant Pre Intervention Weight	4	.990	.010
Pair 2	Participant Post Intervention BMI & Participant Pre Intervention BMI	4	.987	.013
Pair 3	Participant Post Intervention HbA1c & Participant Pre Intervention HbA1c	4	.801	.199
Pair 4	Participant Post Intervention Questionnaire Score & Participant Pre Intervention Questionnaire Score	4	.973	.027

Table 3

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Participant Post Intervention Weight - Participant Pre Intervention Weight	4.00000	2.94392	1.47196	-8.68443	.68443	-2.717	3	.073
Pair 2	Participant Post Intervention BMI - Participant Pre Intervention BMI	.70000	.48305	.24152	-1.46863	.06863	-2.898	3	.063
Pair 3	Participant Post Intervention HbA1c - Participant Pre Intervention HbA1c	.15000	.12910	.06455	-.35543	.05543	-2.324	3	.103
Pair 4	Participant Post Intervention Questionnaire Score - Participant Pre Intervention Questionnaire Score	7.50000	5.00000	2.50000	-.45612	15.45612	3.000	3	.058

Appendix M

Final DNP Project Poster



Appendix N

Final DNP Project Presentation

RUTGERS THE STATE UNIVERSITY OF NEW JERSEY School of Nursing

**A Novel Approach to Diabetes Prevention:
Implementation of a Multimedia-Based
Diabetes Prevention Program**

DNP Student: Rosemary Buonocore, BSN, RN
DNP Project Chair: Dr. Kathy T Gunkel, DNP, APN, WHNP-C, ANP-C
DNP Project Team Member: Dr. Miriam Lefkowitz, MD

RUTGERS School of Nursing

Prediabetes

- Approximately **84 Million** Americans have **Prediabetes**.
- More than **1 in 3** American Adults has **Prediabetes**.
- 9 out of 10** people with **Prediabetes** does not know they have it.
- If you have **Prediabetes** you are more likely to get:
 - Type 2 Diabetes Mellitus
 - Heart Disease
 - Stroke
 - Blindness
 - Kidney failure
 - Loss of toes, feet, or legs

PREDIABETES INCREASES YOUR RISK OF ...

PREDIABETES COULD IT BE YOU? CDC

84.1 million Americans adults — more than 1 in 3 — have prediabetes

9 out of 10 people with prediabetes don't know they have it.

(CDC, 2018; Google Images, 2019) 2

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Background and Significance
Who is at Risk?

Risk Factors

- Overweight or obese
- 45 years of age or older
- Parent or sibling has type 2 diabetes
- Physically active fewer than 3 times per week
- Gave birth to a baby that weighed more than 9 pounds
- Gestational diabetes
- Polycystic Ovary Syndrome

Race and Ethnicity

- African Americans
- Hispanic/Latino Americans
- American Indians
- Pacific Islanders
- Asian Americans

WHO'S AT RISK for prediabetes or type 2 diabetes? Approximately 84 million Americans have prediabetes and 1 in 3 adults have type 2 diabetes. That's why it makes sense to know the risk factors.

DID YOU KNOW... ...that diabetes and prediabetes are preventable conditions. If you have any of the risk factors, ask your doctor about getting your blood sugar tested.

(CDC, 2018; Google Images, 2019; Warren, 2017) 3

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Background and Significance

Economic Impact

- Diabetes has a massive economic impact on millions of individuals, their families, and the health care systems in the U.S.

National Health Policy

- Healthy People 2020 Objectives
 - Reduce Economic Burden
 - Reduce Disease Burden
 - Improve Quality of Life

Health Policy

- Considered a Global epidemic with approximately **285 million** people.
- The International Diabetes Federation & United Nations (UN) advocate for governments to set policies that promote prevention models.

Affordable for all Citizens

(Bergman et al., 2012; CDC, 2018; Google Images, 2020; Parsons, 2018; Ica, 2012; UNODH, 2014; Warren, 2017) 4

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Needs Assessment

Continual Rise of Prediabetes → U.S.S.T.P. Recommendations → Research → Current Practice → Discussions with Key Stakeholders & Patients

Gap In Care

(Kandala et al., 2017; Ica, 2012) 5

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Problem Statement

The purpose of this quality improvement project is to determine whether a multimedia-based diabetes prevention program reverses or reduces the progression of **prediabetes** and prevents type 2 diabetes mellitus.

Clinical Question

PICO(T) question: In a mixed group of English-speaking male and female patients above the age of 18 years old diagnosed with **prediabetes**, how does the implementation of a Multimedia-Based Diabetes Prevention Program compared to usual care affect the progression of **prediabetes** and the prevention of Type 2 Diabetes Mellitus within a 90-day time period?

6

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Aims and Objectives

Aims

- ❖ Reduce the progression of **prediabetes** and prevent type 2 diabetes mellitus with the implementation of a multimedia-based diabetes prevention program.

Objectives

- ❖ Educate patients on lifestyle modifications to delay or stop the progression of **prediabetes** and prevent type 2 diabetes mellitus.
 - ❖ Measure HbA1c level
- ❖ Evaluation Objective: Assess the understanding of material in the Diabetes Prevention Program PowerPoint presentation with a pre/post intervention questionnaire.

7

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Review of the Literature

- ❖ A systematic approach was used to review the literature.
- ❖ A literature review was completed to investigate three important areas of the clinical question:
 1. **Determine if the Diabetes Prevention Program (DPP) reverses prediabetes and prevents type 2 diabetes mellitus**
 2. **The effectiveness of a Multimedia based Diabetes Prevention Program**
 3. **Utilization of the Diabetes Prevention Program in Primary Care**
- ❖ The electronic databases utilized included PubMed, CINAHL, and Medline.
- ❖ The MeSH terms included:
 - ❖ Prediabetic State, Primary Prevention, Diabetes Mellitus, Type 2, Multimedia, Exercise Therapy, and Diet Therapy.
- ❖ Key terms included:
 - ❖ *Prediabetes, Diabetes Prevention Program, diabetes prevention, effectiveness, primary care, education video*
 - ❖ The filters applied included:
 - ❖ English language, human and publication within the past 5 years
- ❖ All articles were appraised using the John Hopkins Nursing Evidence-Based Evidence Appraisal Tool (Dang & Dearholt, 2017).
- ❖ 98 potential sources found in the search & 10 articles were used for this project
 - ❖ All articles were high or good quality
 - ❖ three articles had an evidence level 1
 - ❖ five articles had an evidence level 2
 - ❖ two articles were level 4 and level 5

8

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Review of Literature

Diabetes Prevention Program Prevents Type 2 Diabetes Mellitus

- ❖ From the literature reviewed, the utilization of the Diabetes Prevention Program significantly reduces the progression of **prediabetes** and prevents type 2 diabetes mellitus (ADA, 2018; Aguiar et al., 2016; Allende-Vigo, 2015; Brunisholz et al., 2017; Dawes et al., 2014; Kramer et al., 2018; Nathan et al., 2015; Michaelides, Raby, Wood, Farr, & Toro-Ramos, 2016; Mudaliar et al., 2016; Sepah, Jiang, Ellis, Medermott, & Peters, 2017).
- ❖ Evidence reveals the effectiveness of the DPP in delaying the progression of **prediabetes** and preventing type 2 diabetes mellitus by reducing weight, HbA1c, FBG, cholesterol, waist circumference, cardiovascular disease risk factors. This evidence gives the rationale for implementation of the DPP in this quality improvement project (Kramer et al., 2018).
- ❖ Nathan et al. (2015) revealed the incidence of diabetes was reduced by 58% in the lifestyle intervention group by year 3. The incidence of diabetes was statistically significantly ($p < .0001$) reduced by 27% in the lifestyle intervention compared to placebo group over the 15 years (Nathan et al., 2015).
- ❖ The results of the Diabetes Prevention Outcome Study (DPPPOS) showed positive long-term effects with lifestyle intervention in the reduction of type 2 diabetes mellitus incidence (Nathan et al., 2015).
- ❖ The economic analysis over 10 years showed that lifestyle intervention was also cost-effective (Nathan et al., 2015).

9

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Review of Literature

The Effectiveness of a Multimedia-Based Diabetes Prevention Program

- ❖ The literature review revealed that a Multimedia-Based Diabetes Prevention Program is effective in reducing the progression of **prediabetes** and prevents type 2 diabetes mellitus (Aguiar et al., 2016; Michaelides et al., 2016; Sepah et al., 2017).

Utilization of the Diabetes Prevention Program in Primary Care

- ❖ The use of a multimedia based DPP intervention has the potential to reduce delivery costs, participant burden, increase participation and be implemented in primary care setting in rural and remote areas (ADA, 2018; Aguiar et al., 2016; Michaelides et al., 2016; Nathan et al., 2015).
- ❖ The American Diabetes Association (ADA, 2018) recommends primary care practitioners to refer patients diagnosed with prediabetes to an intensive behavioral lifestyle intervention program modeled from the DPP to achieve and maintain a 7% initial weight loss and increase physical activity to at least 150 min/week.

In summary, the review of literature supported the utilization of a multimedia based DPP lifestyle intervention to reduce the progression of prediabetes and prevent type 2 diabetes mellitus. In addition, the DPP lifestyle intervention was shown to significantly decrease weight, HbA1c, FBG, BMI, waist circumference, and cholesterol. Evidence revealed that the multimedia based DPP lifestyle intervention was cost effective, help relieve the participant burden, increase participation and can be implemented in the primary care setting. 10

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Theoretical Framework

Health Belief Model

- ❖ The **Health Belief Model** is a framework that could be used to help motivate patients to modify their lifestyle by exercising, eating a healthy diet, logging their meals in their food diary to aid in their weight loss.
- ❖ With education, support, and a positive attitude, patients will be able to reverse their **prediabetes**, prevent type 2 diabetes mellitus, and live a long and healthy life.

(Polymorphism, Chiquelone, & Khaden-Rossiter, 2016; Health Belief Model, 2018) 11

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Methodology

Design	Quasi-Experimental Quantitative Study
Setting	Solo Internal Medicine Practice in Central New Jersey
Study Population	Purposeful Sample of Adults diagnosed with Prediabetes
Recruitment	Recruitment Flyers, In-Person Recruitment, Telephone Conversation
Consent	Participants were asked to sign Consent
Risks and Harm	Minimal Risk, No anticipated Discomfort
Cost/Compensation	No Cost
Intervention	Questionnaire, PowerPoint, Educational Handouts, Food Diary Journal, MyFitnessPal App for smartphones (optional)

(Tappen, 2016 p.66) 12

Successful or Not?

❖ Unfortunately, the results of this project was **not** statistically significant.

What happened?

- ❖ Recruitment Failure
 - ❖ Busy with work, family, upcoming holiday season.
 - ❖ Not ready to start a new exercise and diet regimen.
- ❖ Small Sample Size
 - ❖ Original Sample Size was 6
 - ❖ Participants, 2 Participants dropped out of the project.
- ❖ Retention Failure
 - ❖ Unable to contact Participants

Remediate

- ❖ Recruitment Failure
 - ❖ Train team member to implement the project immediately if patients showed interest during scheduled office visit.
- ❖ Retention Failure
 - ❖ Schedule a follow up nurse visit at the time of the project implementation appointment.
 - ❖ Appointment reminder.

19

Implications

- ❖ Minimized the gap in care by educating patients about lifestyle modifications to reduce the progression of prediabetes and prevent type 2 diabetes mellitus.
- ❖ Cost Effective
 - ❖ No Financial Cost to Participant or Practitioner
- ❖ Reduces Participant Burden
- ❖ Saved the Practitioner Time
- ❖ Improved Quality of Care
 - ❖ Instead of educating patients for five minutes, the practitioner can simply play the PowerPoint which ensures the patient has received the proper education about their condition and how to treat prediabetes and saves the Practitioner time.

20

Sustainability

- ❖ Team Member will continue to disseminate and implement this multimedia-based diabetes prevention education program using the PowerPoint and educational handouts.
- ❖ Improve Access to Care:
 - ❖ Providing the education PowerPoint with audio to health centers, YMCA's and other Primary Care Offices to promote the prevention of type 2 diabetes mellitus.

21

Professional Reporting

- ❖ Rutgers Poster Day
- ❖ Publish in Journal
 - ❖ Journal of the American Association of Nurse Practitioners (JAANP)
 - ❖ Journal of Advanced Nursing
- ❖ Publish in Rutgers Library Database.

22

THANK YOU

- ❖ I would like to give thanks my Chair Dr. Kathy Gunkel and my Team Member Dr. Miriam Leikowitz for their help, ongoing support and guidance during this whole experience. Without your help, support, and guidance I would not of been able to successfully complete my DNP Project.
- ❖ I would like to especially thank my wonderful husband for all of his love, support, and encouragement during the last three years. Without you, I would not be where I am today.

Questions???

23

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24

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25

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26

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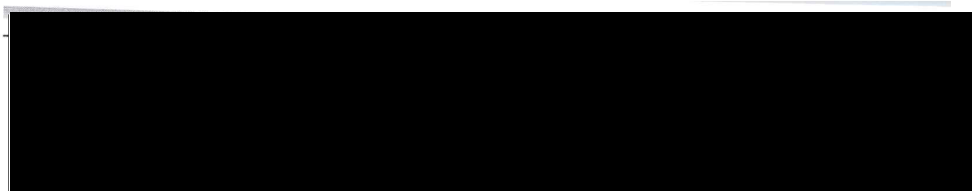
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27

Appendix P

Letter of Cooperation



Date: 02/18/2019

Re: Letter of Cooperation for [REDACTED]

This letter confirms that that I, as an authorized representative of [REDACTED] allow the Principal Investigator access to conduct study related activities at the listed site, as discussed with the Principal Investigator and briefly outlined below, and which may commence when the Principal Investigator provides evidence of IRB approval for the proposed project.

- **Research Site:** [REDACTED]
- **Study Purpose:** The purpose of this healthcare delivery innovation project is to determine whether a Multimedia based Diabetes Prevention Program reverses or reduces the progression of prediabetes and prevents type 2 diabetes. The aim of this project is to reduce the progression of prediabetes and prevent type 2 diabetes by making an educational video on lifestyle modifications, providing handouts to patients on information about the Diabetes Prevention Program, and give food diaries to participating patients.
- **Study Activities:** The project would use an education video containing the information from the CDC Diabetes Prevention Program. The handouts provided to patients will coincide with the information in the video to reinforce the material. The food diaries will help patients track what they are eating, provide motivation, encourage adherence to healthy diet, and assist in weight loss. The measurement of the patients HbA1c levels at the diagnosis of prediabetes and 90 days post intervention will be the measurement of success. The evaluation objective is to assess the understanding of material in the Diabetes Prevention Program video with a survey completed immediately after the intervention is implemented. Patient charts will be accessed via the electronic medical record system called Practice Fusion.
- **Subject Enrollment:** Subject inclusion criteria is male or female, above the age of 18, who has a HbA1c level between 5.7% to 6.4%. The sample size target is 50 participants.

Letter of Cooperation for Study: The Novel Approach to Diabetes Prevention: Implementation of a Multimedia Based Diabetes Prevention Program to Educate Lifestyle Modifications Reducing the Progression of Prediabetes and the Prevention of Type 2 Diabetes Mellitus

- [REDACTED]
- **Site(s) Support:** [REDACTED] offers the practice to conduct study activities, authorizes site medical staff including Dr. [REDACTED] to identify persons who might qualify for the study, distribute educational handouts, distribute and collect surveys, retrieve patient data from practice charts, and collect HbA1c blood samples from patients.
- **Data Management:** Patient data will be collected from patients and electronic medical record system Practice Fusion. Age, gender, non-modifiable and modifiable risk factors, vitals, weight, height, body mass index (BMI), hemoglobin A1C (HbA1c), and survey results will be collected. Patient data will be identifiable with a number to evaluate HbA1C, weight, and BMI pre and post intervention. The patient data in the electronic medical record Practice Fusion will be protected with a password and my personal computer is protected with a password.
- **Anticipated End Date:** Research activities at the site will conclude on January 17, 2020.

We understand that this site's participation will only take place during the study's active IRB approval period. All study related activities must cease if IRB approval expires or is suspended. I understand that any activities involving Personal Private Information or Protected Health Information may require compliance with HIPAA Laws and Rutgers Policy.

Our organization agrees to the terms and conditions stated above. If we have any concerns related to this project, we will contact the Principal Investigator. For concerns regarding IRB policy or human subject welfare, we may also contact the Rutgers IRB (see orra.rutgers.edu/hssp).

Regards,

[REDACTED]

Appendix S

DNP Project Proposal Evaluation Form



Appendix 12: DNP Project Proposal Evaluation Form

Proposal Approval Form

All DNP Projects require formal presentation to the DNP Team. After the presentation, the DNP Team will complete this form. A copy of the form must be uploaded into the electronic drop box located in ***DNP Project Checklist*** [learning management systems (LMS)]. Students and DNP Team Members should also keep a copy for their records. **Level 3 or higher is required on all components.**

Full Title of DNP Project A Novel Approach to Diabetes Prevention: Implementation of a Multimedia-Based Diabetes Prevention Program

Name of Team Members

Student(s) Rosemary M. Daugherty

DNP Chair Dr. Kathy Gunkel, DNP, APN, WHNP-C

DNP Team Member Dr. Miriam Lefkowitz, MD.

DNP Team Member _____

DNP Team Member _____

Date of Presentation 5/8/2019

Component	1 Very Poorly	2 Poorly	3 Good	4 Very Good	5 Excellent	Comments
Cover Page, Table of Contents, Abstract (< 250 words), and general formatting meet APA requirements and RUSN instructions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
Introduction: Basic overview of project and describes the contribution it will make to change practice and impact outcomes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	

Component	1 Very Poorly	2 Poorly	3 Good	4 Very Good	5 Excellent	Comments
Background & Significance: The problem or gap is clearly identified. Description of the problem/gap includes, the population affected, what is currently happening, why the audience should care, what we currently know, and what we need to find out is articulated. The significance is explained in detail to include the impact/status of the problem/gap on population, cost, policy, education, healthcare systems, and beyond.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
Needs Assessment: The need, feasibility, and resources available are discussed. Congruence of the project to the organization's mission is evident. The student describes logically the contextual/organizational environment. Discusses previous attempts or possible solutions to the problem based on evidence and experience. Was a specific process used? Ex: SWOT, Community Assessment, etc. Describe:	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
Problem/Purpose Statement: Problem/Purpose is clearly stated and summarized. Scope of project is realistic and appropriate to DNP Scholarship.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
Clinical Question: The student frames an answerable clinical question related to the problem/practice gap.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
Aims & Objectives: All aims are supported by objectives that are specific, measurable, achievable, realistic, and time-bound.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	

Component	1 Very Poorly	2 Poorly	3 Good	4 Very Good	5 Excellent	Comments
Review of Literature: Directly relates to answering the posed Clinical Question. Databases used, key terms, and search strategy are described. Evidence is appraised and synthesized into an Evidence Table using the instructions by Dearholt & Dang (2012). The student articulates a written summary of the findings and does not simply regurgitate information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
Theory/Framework: The theory/framework for the project is described and applicable to operationalizing the project. A concept map is presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
Methodology: The overall design of the project correlates to the Aims & Objectives. The student clearly communicates the: Setting, Study Population, and Recruitment Strategy. The consent Procedure, Risk/Harms to Participants, and Cost/Compensation for Participants. The study intervention(s) is/are described in detail. Progress Indicators/Outcomes to be measured are relevant to the project. Tools/Instruments are appropriate. A project timeline and budget/resource list is presented.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
Evaluation Plan: An evaluation plan for the DNP Project Process is included. Evaluation measures, tools, instruments, and measures match the Aims/Objectives and Project Type.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
IRB: All Rutgers IRB requirements are meet.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	

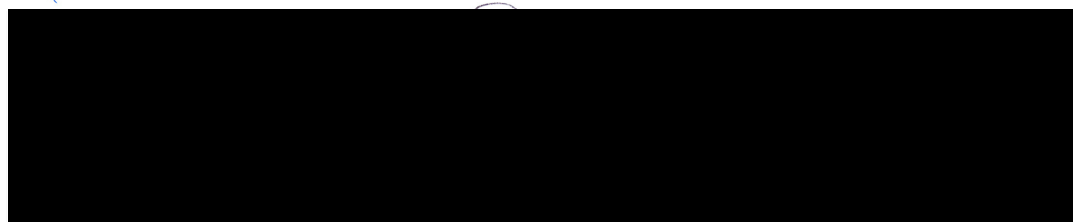
All organizational IRB requirements are met.						
Letter of Cooperation is included.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
Formal Presentation of DNP Project: Presentation is presented on Rutgers-School templated slides and includes all relevant aspects of the project. The student's appearance and presentation skills meet doctoral expectations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	
Turn-It-In Originality Report is included.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	

Comments _____

Describe Corrective Actions if Revisions Required _____
 (Use additional paper if necessary)

Select the Outcome of the presentation:

☒ Approved as presented ☐ Approved with minor revisions ☐ Reject proposal



Date 4/9/19

UPLOAD signed form into the *DNP Project Checklist (LMS)*.

Appendix T

Final DNP Project Evaluation Form

Appendix 2

**Doctor of Nursing Practice
Project Final Evaluation Framework**

Student's Name: Rosemary Buonocore

Title of DNP: A Novel Approach to Diabetes Prevention: Implementation of a Multimedia-Based

Diabetes Prevention Program

	1 = Very poorly	2 = Poorly	3 = Good	4 = Very Good	5 = Excellent	
	1 (Fail)	2	3	4	5	Comments
I. DNP Components						
The candidate addresses each DNP component:					✓	
Background and Significance						
Background information/literature demonstrates the focused need or problem.					✓	
Literature review supports significance/relevance of problem/proposed project/intervention.					✓	
Need, feasibility and significance are clearly presented.					✓	
Problem Statement or Purpose						
Problem/purpose clearly described.					✓	
Scope of project realistic and appropriate.					✓	
Theoretical Framework						
Framework (theoretical/conceptual/practice) is described/evident and applicable.					✓	
Project Description						
Literature, benchmarks and supporting data provided and organized into integrated synthesized summary.					✓	
Objectives stated in feasible and measurable terms.					✓	
Congruence of organizations' strategic plan to project is described.					✓	
Project Design						
Appropriate for objectives.					✓	
Clear rationale for action/s/method.					✓	

Setting and group clearly described.					✓	✓
Implementation methods/tools/measures clearly described.					✓	✓
Resources/supports and risks/threats and benefits noted.					✓	✓
Time frame outlined.					✓	✓
Evaluation Plan						
Analysis/Evaluation plan coherent / consistent with project plan.					✓	✓
Evaluation measures linked to objectives.					✓	✓
Outcomes/evidence-based measures appropriate for objectives.					✓	✓
Tools/instruments described and linked to measures and objectives.					✓	✓
Method of analysis clearly described for each measurement.					✓	✓
Findings						
Findings organized in appropriate format.					✓	✓
Findings linked to problem statement, purpose objectives and evaluation plan.					✓	✓
Described the extent to which the objectives were achieved.					✓	✓
Addressed key facilitators and barriers that impacted the project's objectives.					✓	✓
Described unintended consequences (both positive and negative).					✓	✓
Recommendations/Implications						
Recommendations/Implications addressed for problem statement, supporting organization, key stakeholders, other settings, and student.					✓	✓
Included recommendations related to identified facilitators / barriers and unintended consequences.					✓	✓
Addressed any ongoing activities or evaluations outside the scope of the DNP Project.					✓	✓
Writing and Organization						
APA format followed appropriately; writing is scholarly and clear; appropriate for doctoral level education.					✓	✓
II. Project Synthesis						
Extent to which candidate met goals/aims of project. If not, appropriate rationale and					✓	✓

explanation provided.						
Extent to which candidate integrated scientific curiosity and inquiry in project completion.						✓
Extent to which candidate analyzed issues and provided critique of advanced nursing practice within the project.						✓
Extent to which candidate demonstrated practice inquiry skills including appraising and translating evidence.						✓
Evidence of candidate's ability to engage in collaborative partnership(s) in designing and implementing DNP project.						✓
Ability of candidate to articulate state of current knowledge as it relates to advanced practice nursing in the health care system.						✓

a. **Approve the DNP Project**

Once the DNP Project Proposal is approved, the student becomes eligible for graduation at which time the DNP candidate will be granted the degree along with the rights and privileges awarded by the degree.

b. **Conditionally approve the DNP Project with minor revisions**

The student will file a final/revised Project Proposal to Doctoral Committee Chair within two weeks of the proposal defense meeting.

c. **Reject the DNP Project**

The student must develop a significantly revised or new proposal. The Doctoral Committee Chair will work with the candidate on the revision. The Doctoral Committee will review the new proposal and all prior steps will be repeated.