

IMPLEMENTING A DIABETES SCREENING PROTOCOL

by

Allison Ernst

Paper submitted in partial fulfillment of the
requirements for the degree of

Doctor of Nursing Practice

East Carolina University
College of Nursing

Date Finalized

July 17, 2019

Abstract

Type 2 diabetes is one of the greatest health concerns today. While one in ten Americans suffer from diabetes, 25% of them are unaware they have the disease. One third of the population has prediabetes, yet less than 12% have been told by a healthcare provider they have the condition. Clinicians are not adequately screening and educating their patients regarding their risk for this progressive and potentially debilitating disease.

Purpose: The purpose of this quality improvement project was to implement a protocol encouraging providers to appropriately screen their patients for their type 2 diabetes risk.

Methods: Participating healthcare providers were instructed to use the American Diabetes Association's screening tool during each new patient encounter in a twelve-week period. The intervention asked three clinicians in a private practice to assess patients' risk of developing diabetes according to the evidence-based tool. They then offered education on prediabetes, diabetes, and further testing. Completed screening tools were collected at the end of the intervention period and assessed for provider compliance.

Outcome: Clinicians saw 151 new patients during the data collection period and screened 150 of them using the diabetes risk assessment tool. Sixty-nine patients were found to have a high risk for developing diabetes and 81 patients had low-risk scores. Educational material was provided to all new patients. The participating providers in the practice were able to implement the new screening protocol with a 99.34% success rate and did not require formal reminders or further education to maintain compliance.

Key words: screening; prevention; prediabetes; type 2 diabetes; obesity; risk assessment; education; evidence-based practice; screening protocols

Table of Contents

Abstract	2
Chapter One: The Impact of Undiagnosed Diabetes	7
Background Information	7
Significance of Clinical Problem	9
Question Guiding Inquiry (PICO)	11
Population	11
Intervention	11
Comparison	12
Outcome	12
Summary	12
Chapter Two: Review of the Literature Evidence	14
Methodology	14
Sampling strategies	14
Evaluation criteria	15
Literature Review Findings	15
Discussion of findings	15
Advantages and disadvantages of findings	17
Limitations of Literature Review Process	19
Implementation of findings in practice	19
Summary	20
Chapter Three: Theory and Concept Model	22
Practice Change Theory	22
Application to practice change	23

Concept Analysis24

Summary26

Chapter Four: Pre-implementation Plan27

Project Purpose27

Project Management27

 Organizational readiness for change.....27

 Inter-professional collaboration28

 Risk management assessment.....29

 Organizational approval.....31

 Information technology.....31

Cost Analysis of Materials.....31

Plans for Institutional Review Board Approval.....32

Project Evaluation.....32

 Demographics32

 Outcome measurement.....32

 Evaluation tool32

 Data analysis33

 Data management.....33

Summary33

Chapter Five: Implementation Process35

Setting35

Participants.....35

Recruitment.....36

Implementation Process36

Education36

Data Collection37

Analysis.....37

Plan Variation38

Summary38

Chapter Six: Evaluation of the Practice Change Initiative40

Participant Demographics.....40

Intended Outcome.....40

Findings41

 Figure 142

 Patient Characteristics.....42

Post-intervention Feedback.....43

Implications for Practice.....44

Summary44

Chapter Seven: Implications for Nursing Practice.....45

Practice Implications.....45

 Essential I: Scientific underpinnings for practice45

 Essential II: Organization and systems leadership for quality
improvement and systems thinking46

 Essential III: Clinical scholarship and analytical methods for EBP46

 Essential IV: Information systems/technology and patient care
technology for the improvement and transformation of healthcare.....47

 Essential V: Healthcare policy for advocacy in healthcare48

 Essential VI: Interprofessional collaboration for improving patient
and population health outcomes.....48

 Essential VII: Clinical prevention and population health for

improving the nation’s health49

Essential VIII: Advanced nursing practice50

Summary50

Chapter Eight: Final Conclusions51

 Significance of Findings51

 Project Benefits52

 Project Strengths and Limitations53

 Recommendations for Practice54

 Final Summary56

References58

Appendix A: Clinical Site Letter of Support64

Appendix B: Letter of Institutional Support65

Appendix C: Survey for IRB Approval66

Appendix D: ADA Diabetes Risk Assessment68

Chapter One: The Impact of Undiagnosed Diabetes

The rising rate of individuals suffering from chronic disease has long been a source of concern in the United States. Many of the leading causes of mortality and morbidity are related to conditions that may be attenuated through early detection and treatment. Although diabetes ranks seventh as a leading cause of death in the nation, the presence of the disease contributes to the development of cerebrovascular disease, nephritis, and the most common cause of death, cardiovascular disease (National Center for Health Statistics, 2017).

Type 2 diabetes affects nearly ten percent of the population and one in four adults over the age of 65 (Centers for Disease Control and Prevention [CDC], 2017). One of the more concerning aspects of this illness is that 23.8% of individuals with diabetes are unaware they have the condition (CDC, 2017). More than seven million Americans are undiagnosed and at risk for complications of this progressive illness characterized by few if any initial symptoms (CDC, 2017). Furthermore, one third of all adults in the United States and one half of adults over age 65 have prediabetes, a precursor that may be addressed prior to the onset of disease (CDC, 2017).

The American Diabetes Association (ADA) publishes clear screening recommendations and guidelines for practitioners (2018a). Appropriate screening and timely diagnosis slows disease progression and reduces the risk of serious complications (ADA, 2018a). Research suggests routine blood work may show early indicators of disease as many as twenty-five years prior to the onset of diabetes (Dottinga, 2017). By consistently applying these guidelines to their practice providers may be able to increase rates of detection in at-risk populations. This chapter serves to illustrate the impact of diabetes, the benefit of implementing screening guidelines, and the importance of promoting evidence-based interventions.

Background Information

Type 2 diabetes is defined as hyperglycemia related to the progressive decline of insulin secretion as a result of genetic and environmental factors (Skyler et al., 2017). The body's inability to maintain appropriate insulin production and glucose levels often follows a period of insulin resistance and may be impacted by inflammatory and metabolic stressors (Skyler et al., 2017). Vascular damage as a result of chronic hyperglycemia leads to complications, which severely impact the wellbeing of individuals with diabetes. Common sequelae include retinopathy, nephropathy, neuropathy, peripheral artery disease, coronary artery disease, and stroke (Skyler et al., 2017).

Diagnostic criteria may be obtained by one of four methods. Obtaining a fasting plasma glucose greater than 126 mg/dL, a two hour post-prandial glucose greater than 200 mg/dL during an oral glucose tolerance test, an A1C higher than 6.5%, or a random plasma glucose above 200 mg/dL in a symptomatic hyperglycemic patient may all confirm the diagnosis (ADA, 2018a). The ADA notes the same tests are used for both screening and diagnosing diabetes and should be repeated in the absence of definitive results (ADA, 2018a).

Prediabetes, commonly a precursor to diabetes, affects 86 million people in the United States (Skyler et al., 2017). A progressive decline in insulin production characterizes this state of dysglycemia. Rather than a separate condition, prediabetes should be considered a heightened risk for diabetes and is defined by impaired fasting glucose, impaired glucose tolerance, or an A1C of 5.7-6.4% (ADA, 2018a). While 33.9% of adults are living with prediabetes nationwide, the CDC notes less than 12% of them report a health care provider ever telling them about their condition (CDC, 2017). Clinicians are clearly missing opportunities to identify at-risk patients and promote early interventions and lifestyle modifications that may alter the course of the disease.

Current Guidelines. The ADA recommends the following guidelines for screening patients for diabetes. In individuals with no risk factors screening may begin at age 45 and reoccur every three years if results are normal. Testing should be considered in individuals with a body mass index (BMI) greater than 25 or with one or more additional risk factors, discussed below. Patients with prediabetes should be tested annually and women with a history of gestational diabetes should undergo lifelong screening every three years (ADA, 2018a).

Due to the combined genetic and environmental factors that contribute to the development of disease there are subsets of the population at higher risk of developing diabetes. Screening should be prioritized in patients who are overweight or obese, have a first-degree relative with diabetes, are of a high-risk ethnicity, have a history of cardiovascular disease or gestational diabetes, or are physically inactive (ADA, 2018a). Additionally, individuals who have hyperlipidemia, hypertension, polycystic ovary syndrome, or signs of insulin resistance are of elevated risk and require testing (ADA, 2018a). Neither genetic nor environmental contributors should be overlooked when considering screening. Skyler and colleagues (2017) credit genetic markers and mutations for some of the disease burden and note there is a 40% chance of developing diabetes if one parent has type 2 diabetes. Obesity is the most common modifiable risk factor related to the development of diabetes and research indicates lifestyle change offers the greatest improvement in glucose control (Pippitt, Li, & Gurgle, 2016).

Significance of Clinical Problem

Diabetes is considered by some to be the greatest health epidemic that has been encountered (Zimmet, 2017). Agencies such as the World Health Organization have consistently underestimated the rapid rise of type 2 diabetes worldwide. According to the International Diabetes Federation (2017) 425 million adults worldwide have diabetes, with half of those remaining undiagnosed. Diabetes is one of the most commonly diagnosed illnesses by primary

care providers and the incidence is projected to continue to soar in the coming years (Huang, Basu, O'Grady, & Capretta, 2009). Those suffering from diabetes are at risk for significant health concerns. Associated conditions range from manageable ailments to debilitating or fatal complications. Diabetes contributes to kidney disease, blindness, and limb amputations as well as stroke and cardiovascular disease (Phillips, Ratner, Buse, & Kahn, 2014).

The economic burden of diabetes has been well documented. The estimated average lifetime cost of diabetes to an individual is \$211,400, with greater spending for females and those diagnosed at a younger age (Zhuo et al., 2014). The CDC stated that persons with diabetes spend 2.3 times more in medical expenditures than individuals without the condition (CDC, 2017). Additionally, the cost of managing diabetes in the United States exceeded \$245 billion in recent years. It accounts for \$69 billion in reduced productivity (CDC, 2017). Encouraging prevention and early action benefits not only the many individuals at risk, but serves communities as a whole.

Problem Statement

The importance of regular screening cannot be over emphasized as the incidence of type 2 diabetes continues to rise. Early testing helps prevent the onset of disease before complications occur. While studies suggest testing individuals with diabetes does not improve mortality, those with prediabetes or impaired glucose tolerance are able to delay the onset of disease with lifestyle modification and medication (Pippitt et al., 2016). Phillips et al. (2014) noted most clinicians do not optimally treat prediabetic patients and often delay appropriate therapy once patients develop frank diabetes. Patients are often unaware of their disease state during the period in which it is most important to intervene. Failing to adhere to screening and treatment guidelines leaves patients exposed to hyperglycemia's effects for years which limits their ability to delay or reverse the disease (Phillips et al., 2014).

Patients who benefit from early intervention can manage their condition with fewer medications for years longer than patients who began treatment later (Phillips et al., 2014). Thus, research suggests that by identifying high-risk individuals with early onset diabetes and by recommending interventions to support normal blood glucose, one may significantly delay the onset of progression of diabetes (Phillips et al., 2014). Screening guidelines should be consistently followed to address patients at risk for diabetes, particularly those with additional risk factors or comorbidities.

Question Guiding Inquiry

Population. The clinical site of interest was a private practice focused on the treatment of obesity and related illnesses in adults. The clinic was located in an urban southern city and treated approximately 375 patients weekly. One physician, one nurse practitioner, two physician assistants, one registered nurse, two registered dietitians, and administrative personnel staffed the practice. The clinicians were the target population as they were responsible for identifying at-risk patients and offering counseling. The majority of patients had a BMI greater than 30 and presented to the clinic voluntarily to manage their weight. This patient population frequently had concurrent diagnoses of hypertension, insulin resistance, diabetes, and dyslipidemia, though many reported their only health concern was obesity.

Intervention. The intervention consisted of educating clinicians in the practice about the prevalence of prediabetes in at-risk populations and the importance of early intervention. Providers assessing new patients were given a brief screening tool to aid them in identifying at-risk individuals. This screening checklist allowed them to quickly determine whether the patient would benefit from diagnostic testing. If the patient did not fit risk criteria for screening no further action was taken. For patients who had a BMI greater than 25 and carried one or more risk factors, the clinician was instructed to provide printed recommendations for testing along

with ADA guidelines and resources. The provider then documented the patient's risk status and that they had received the screening guidelines.

Comparison. The practice did not have a formalized protocol for identifying and managing patients who are at risk for dysglycemia. There were no consistently implemented screening tools to address a patient's risk status upon initial consultation or during subsequent visits. The prior lack of counseling protocol and printed guidelines served as the comparison to the intervention.

Outcome. By creating a formalized screening protocol in compliance with ADA guidelines the clinicians were more readily able to identify and address patients' risk for prediabetes and diabetes. The success of the intervention was determined via chart reviews which assessed whether patients who fit the criteria for diabetes screening were given appropriate counseling and guidance. At two weeks the providers seeing new patients were encouraged to continue screening at-risk patients during their initial visits. The goal was to apply the ADA screening tool to every applicable new patient. Additionally, at-risk patients would receive additional teaching regarding his or her risk for diabetes. Implementing an office-wide diabetes screening protocol through clinician participation would improve the ability to offer appropriate counseling and guidance.

Summary

The diabetes epidemic continues to grow at an unanticipated and rapid rate worldwide. Given the severe consequences of the disease it is important that clinicians address the fact that millions of Americans are unaware they have prediabetes or diabetes. Understanding the screening guidelines and consistently recommending appropriate testing could significantly decrease the number of people who do not know they could benefit from treatment. Routine

screening practices would facilitate early intervention during a critical treatment window for those with prediabetes.

Providing clinicians with quick and easy to use screening tools fosters an awareness for at-risk patients and promotes consistency. Identifying patients who may develop or already have diabetes is the first important step in early management of the disease. Encouraging patients to explore their own risk and treatment options serves to empower those at risk to take action before it is too late to modify the course of their illness. Although diabetes is a leading cause of death and contributes to a number of debilitating conditions, early detection and management can greatly impact its progression.

Chapter Two: Review of the Literature

Although current guidelines are aimed at the treatment of type 2 diabetes, many clinicians and researchers are concerned greater focus should be placed on targeting prediabetes. As Phillips et al. (2014) argue, clinicians ignore the first ten years of patients' dysglycemia because they fail to identify patients at risk for prediabetes and early type 2 diabetes. If screened appropriately and treated with antihyperglycemic medications early in the progression of the disease, patients may prolong their period of health without additional medication (Phillips et al., 2014). Data also indicates the beta cell decline which characterizes hyperglycemia is unlikely to be reversed once a diagnosis of diabetes is made, even with appropriate glucose stabilization (Bergman, 2014). In many instances the literature supports the theory that missing the opportunity for early treatment leaves little chance for improving progression and end-organ damage from type 2 diabetes (Pippitt et al., 2016). A review of literature indicated that although the benefits of intensive lifestyle interventions are heavily supported by evidence, many clinicians fail to identify patients who are at risk.

Methodology

Sampling strategies. Literature review was conducted through search engines PubMed, CINAHL, and the Laupus Health Science Library catalog. During initial investigation the subjects of diabetes screening, prediabetes, early treatment, and diabetes treatment guidelines were evaluated. Particular attention was given to utilization of screening guidelines by national organizations. Upon conducting a directed literature review, the terms prediabetic state and patient education yielded eight results via CINAHL and 85 articles from PubMed. Medical Subject Headings (MeSH) that were included were prediabetes, prediabetic, patient education as topic, and patient education handout.

Evaluation criteria. Results were limited to academic journal articles published since 2008 due to a relatively small return of relevant studies in the last five years. Articles were then filtered to exclude pediatric populations, type 1 diabetes, gestational diabetes, and studies that focused on separate medical conditions combined with diabetes or prediabetes. Research that focused on primary care or community settings was most relevant and studies specific to dental practices, rehabilitation centers, or acute care settings was excluded. Studies specific to westernized medicine were prioritized to best match the population of interest. A number of results were personal opinions, editorials, planned studies not yet conducted, or news briefs and were not included in the literature review as they did not represent rigorous academic research. After applying basic inclusion criteria to the literature search focused on studies reporting prediabetic patient education and outcomes, a total of 46 articles were selected for evaluation.

Literature Review Findings

The majority of articles reviewed supported the efficacy of diabetes prevention programs implemented in a variety of outpatient and community settings. Numerous studies showed clear benefit for programs that provided patient education regarding behavioral change and lifestyle modification when assessing outcomes such as improved glycemic control, weight management, normalized lipids, and waist circumference. All studies reinforced the importance of early provider intervention in order to improve patient outcomes and to prevent or postpone the onset of diabetes.

Discussion

Discussion of findings. A systematic review conducted by Thomas and colleagues (2010) summarizes the findings of the literature review well. Their review found that while less robust programs have proven to be less effective, the implementation of intensive lifestyle interventions reduces the risk of diabetes by half (Thomas et al., 2010). Given the rapid rate at

which diabetes is increasing worldwide, focus on preventing this disease may prevent countries from becoming overwhelmed by the morbidity and mortality associated with this epidemic (Thomas et al., 2010). Tuso (2014) agrees, noting that if the prediabetic state is left untreated 37% of individuals with the condition will progress to develop diabetes in four years. Well-timed lifestyle interventions may reduce the rate of progression to 20% and may postpone the diagnosis of diabetes by as many as ten years (Tuso, 2014).

Increased Clinicians and Locations. Research also supported a multidisciplinary approach to screening and educating patients. A number of studies found patient outcomes improved whether interventions were directed by diabetes educators, medical providers, or unpaid volunteers (Kramer, McWilliams, Chen, & Siminerio, 2011; Murray, Gasper, Irvine, Scarpello, Sampson, 2012; Vadheim et al., 2010). Interventions were successful when conducted via community organizations, telehealth, pharmacies, or in primary care settings (Kramer et al., 2011; Murray et al., 2012; Vadheim et al., 2010). The combined evidence of benefit for offering support to prediabetic patients shows testing and education can happen through many pathways to positively impact patient outcomes.

Provider Support. The research also called for better provider education and support to promote screening and counseling initiatives. While it is well known that the detection and treatment of prediabetes is effective in preventing progression of the disease, most patients in this window of opportunity are not identified (Mainous, Tanner, Scuderi, Porter, & Carek, 2016). A survey revealed physicians who positively acknowledge prediabetes as a clinical construct are more likely to follow national screening guidelines and appropriately initiate early treatment (Mainous et al., 2016). Unfortunately, Mainous and colleagues (2016) found only 58.4% of clinicians surveyed were likely to engage in early testing and treatment. Li et al. offer further support for provider education in a study (2014) which identifies a large gap between national

recommendations and current practice in dietary and medical counseling among newly diagnosed patients with hyperglycemia. It is clear that while evidence supports the benefit of early intervention, clinicians are not consistently applying these guidelines to patient care.

A 2015 study concerned with improving diabetes screening in a rural health department showed a single education session conducted with nurses improved clinician knowledge and compliance to testing guidelines (Rariden, Lavin, & Yun, 2015). This supports the intervention's initial step of educating providers and reinforcing the need for consistent screening protocols. Additionally, a survey revealed that clinicians who were made aware of diabetes screening toolkits and national guidelines were more likely to appropriately identify, test, and refer patients at risk for diabetes (Nhim et al., 2018). Encouraging the use of the ADA's screening recommendations make it more likely providers will offer necessary recommendations.

Implementing policy that encourages alerting patients to their risk status by identifying their risk factors for diabetes allows them to seek appropriate testing. An intervention that educates patients while offering them resources for further action allows them to be proactive in managing their risk. By enacting guidelines currently set in place, a practice can follow the best available recommendations and support their patients' wellbeing.

Advantages and disadvantages of findings. In addition to the advantages previously addressed, it can be argued that treatment with lifestyle modifications or often inexpensive medications have been found to be cost effective if not cost saving to those at risk for diabetes (Phillips et al., 2014). Lawlor and colleagues (2013) report a cost of \$16.85 to identify one at-risk participant and enroll them into an intensive diabetes prevention program, while the cost of care of patients not identified and enrolled in a prevention program was \$1569 more over a two

year period. They conclude the interventions that reduce disease burden are both beneficial and cost effective (Lawlor et al., 2013).

Another advantage noted in literature is the promotion of self-efficacy. Many studies support providing education and skills that enable patients to manage their conditions (Bailey, Little, & Jung, 2016; Li et al., 2014). Patients may feel empowered to control their medical destiny with early testing and may become motivated to enact lifestyle change (Phillips et al., 2014). Offering at-risk patients educational material and resources to pursue further testing is supported by the idea that enhancing self-efficacy improves outcomes (Li et al., 2014).

There were some disadvantages noted in the literature. As with many screening tools, there is concern that overutilization of testing will lead to unnecessary worry and anxiety over undesirable results or even false confidence in those who have normal results (Phillips et al., 2014). While this is a concern, Phillips et al (2014) noted the United States Preventative Services Task Force (USPSTF) did not support the theory that screening for diabetes caused immediate harm. Patients may bear the additional financial burden of medical visits, laboratory testing, and follow up consultations.

The USPSTF also suggested there was a lack of evidence that strict glycemic control based on early screening would prevent microvascular clinical outcomes at a greater rate than beginning treatment after diagnosis (U.S. Preventative Services, 2015). Other studies support the notion that early intervention may not create long-term health benefits. A study by Guess, Caengprasath, Dornhorst, and Frost (2015) noted that patients who were informed of their hyperglycemic state and diabetes risk during screening had more knowledge about their risk status but were not more aware of their diet or weight management. This suggests that even when patients receive appropriate testing and counseling they may not adhere to lifestyle modifications.

Limitations of Literature Review Process

While there continues to be much interest in the management of type 2 diabetes, prediabetes has yet to receive the full attention it deserves. CINAHL yielded eight studies related to prediabetes and patient education in the last ten years, only five of which included rigorous research into patient outcomes. Of the research that was obtained, a number of the studies had small sample sizes, garnished poor response rates from participants, or were one-time educational interventions that did not have a significant impact on patient behavior. For example, Almeida, Shetterly, Smith-Ray, and Estabrooks (2008) noted that of more than 14,000 eligible participants only 1,030 patients attended a weight loss intervention designed to prevent the onset of diabetes. Likewise, a survey assessing provider education needs rendered a 34% response rate that the study authors generalized to the target population (Curran, Hollett, Allen, Steeves, & Dunbar, 2008). These participation rates limit the ability of the studies to be extrapolated to the general population.

The number of results obtained from the key word search required including studies published in the previous ten years rather than a more recent time frame. Had the search rendered more information, a five- year search window would have been preferable. Additionally, limiting results to studies reported in peer reviewed academic journals narrowed the number of available articles considerably.

Implementation of findings in practice. A synthesis of current literature showed support for more consistent diabetes screening and testing. To implement this in practice, it was reasonable to target clinicians responsible for new patient intake and assessment. Routine screening as recommended by the ADA could be encouraged by providing brief instruction to providers, utilizing a screening tool to remind clinicians to address patients' risk status, and providing printed educational information for patients who had an increased risk for diabetes.

The intervention consisted of educating clinicians in the practice about the prevalence of prediabetes in at-risk populations and the importance of early intervention. Providers who assessed new patients were given a brief screening tool to aid them in identifying at-risk individuals. This “rapid screen” checklist allowed them to quickly determine whether the patient would benefit from recommending diabetic testing. If the patient did not fit risk criteria for screening no further action was taken. For patients who had a BMI greater than 25 and carried one or more risk factors, the clinician was instructed to provide printed recommendations for testing along with ADA guidelines and resources. The provider then documented the patient’s risk status and the receipt of screening guidelines.

The printed resources given to at-risk patients include the ADA self-screening tool and diagnostic guidelines to clarify which lab markers indicated prediabetes and diabetes. The material also depicted the national incidence of disease and emphasized the percentage of individuals who unknowingly have prediabetes and diabetes. Instructions for further action were included to encourage patients to pursue the next steps in treatment as needed. Lifestyle modifications and dietary change were emphasized as methods to most significantly impact glycemic control. Additional web resources were also provided to enable patients to further explore their testing and treatment options.

Summary

A review of literature indicated patients benefit from early testing and proactive treatment options to reduce the likelihood of complications from diabetes. Because damage may occur prior to conventionally accepted diagnostic parameters, it is of the utmost importance that individuals are screened as early as possible to postpone negative outcomes. The literature also suggested clinicians are not consistently screening or adequately treating patients who may have prediabetes or early diabetes. To prevent missing the opportunity to provide preventative care,

providers should be diligent about enacting screening protocols for all patients at risk for diabetes.

Chapter Three: Theory and Concept Model

Organizational change in any capacity can be difficult and should be pursued thoughtfully and through the lens of an appropriate theoretical framework. Among a number of change theorists that have contributed to the field of organizational development, Kurt Lewin's work on group dynamics and field theory has been particularly influential. Lewin's model of change analyzes forces which influence individuals to act and has proven to be a valuable tool when implementing change in health care. The likelihood of successfully promoting change among providers is increased by applying Lewin's field theory and three-step model of change to the diabetes screening project.

Application of Change Theory

Lewin's *Field Theory and Learning* asserted individuals' behaviors are influenced by their surroundings and environmental conditions (Lewin, 1997). The term "field theory" describes the process of considering a person's setting, or their field, when studying their behavior as they are influenced by their workplace's structure, management, coworkers, market, and policies (Lewin & Lewin, 1948). With a heightened understanding of these external forces one may better appreciate the basis and correlation of group and individual behaviors. Lewin's field theory also emphasizes the importance of understanding group dynamics due to the association between adhering to social norms, the pressure to conform, and individual decision making (Batras, Duff, & Smith, 2016).

Building upon his field theory, Lewin designed a three-step model of change to assist organizations in implementing change. In the first step, unfreezing, the group identifies problems with the current process and the realized benefits of change begin to outweigh the initial fear of change (Batras, Duff, & Smith, 2016). The second stage, moving, includes the implementation of desired change and entails the research, learning, and continued adjusting that

initiating action requires (Batras, Duff, & Smith, 2016). Lastly, refreezing addresses the shift in organizational practices and behaviors that allow for sustained change (Lewin & Lewin, 1948). This may include restructuring policies, workplace culture, or financial incentives.

Lewin's change theory has been applied to health care organizations and health promotion programs with success. A review of case studies utilizing the three-step model found efficacy and sustainability can be achieved by adopting the organizational change theory as a key part of planning and implementation (Batras, Duff, & Smith, 2016).

Application to practice. Lewin's theory of change was employed to encourage health care providers to adopt recommended screening protocols into their practice. The goal of the diabetes screening project was that providers would consistently and uniformly identify new patients who were at risk for type 2 diabetes. This was a change from the current practice in which the provider did not note the patient's risk status or offer counseling regarding their risk for diabetes. It was assumed there could be barriers and resistance to change, or that the change in practices would be short lived. In order to address these concerns, Lewin's theory of change was applied during the planning phase of implementation.

The group dynamic was addressed by analyzing the norms, management, and pressure to conform to new policies. As the office was relatively small with three full-time advanced practice providers, the culture was close-knit and casual with long standing relationships and openness in communication. In the past policy change had been initiated by one staff member, discussed openly, and implemented in a trial-and-error manner with feedback provided by the group. Per Lewin's field theory, the willingness of the group to collectively accept and enact the requested change contributed to the efficacy and success of the initiative. Additionally, as each provider involved in the intervention was perceived by peers to fully participate, all providers

were more likely to adopt the recommended policy changes through an unstated pressure to conform to expectations.

Additionally, Lewin's three-step theory applied to the desired practice change. The practice was made aware the status quo was insufficient and failed to adequately serve their high-risk patient population. Unfreezing entailed discussing the missed opportunity for screening, addressing the benefits of adding a screening tool to the initial patient exam, and obtaining buy-in from providers. In the moving phase, providers adjusted their behaviors, reviewed nationally recommended treatment and screening guidelines, and integrated the screening tool into their routine care. Refreezing occurred as providers' comfort level with the screening protocol increased and the front office staff began automatically including the screening tool with each new patient chart. Educating all staff about the upcoming change allowed for an organization-wide change that included support from clerical staff that promoted the clinicians' sustained behavioral change.

Concept Analysis

A number of important concepts have been discussed in the background section of Chapter 1. It is essential to clearly define key ideas in order to avoid confusion and accurately convey new ideas and information. The key terms prediabetes, diabetes, screening, BMI, and obesity will be reiterated here.

Prediabetes is commonly a precursor to diabetes and affects 86 million people in the United States (Skyler et al., 2017). A progressive decline in insulin production characterizes this state of dysglycemia. Rather than a separate condition, prediabetes should be considered a heightened risk for diabetes. Clinically, the state is defined by impaired fasting glucose, impaired glucose tolerance, or an A1C of 5.7-6.4% (ADA, 2018a).

Type 2 diabetes is defined as hyperglycemia related to the progressive decline of insulin secretion as a result of genetic and environmental factors (Skyler et al., 2017). The body's inability to maintain appropriate insulin production and glucose levels often follows a period of insulin resistance and may be impacted by inflammatory and metabolic stressors (Skyler et al., 2017). Diagnostic criteria may be obtained by one of four methods. A fasting plasma glucose greater than 126 mg/dL, a two hour post-prandial glucose greater than 200 mg/dL during an oral glucose tolerance test, an A1C higher than 6.5%, or a random plasma glucose above 200 mg/dL in a symptomatic hyperglycemic patient may all confirm the diagnosis (ADA, 2018a). The ADA notes the same tests are used for both screening and diagnosing diabetes and should be repeated in the absence of definitive results (ADA, 2018a).

Within the context of the diabetes screening project, the term *screening* is used to indicate an assessment of an individual's risk factors as defined by the ADA (ADA, 2018a). To conduct the screening the provider uses the patient's physical exam as well as their social, family, and medical history to determine whether the patient fits the following high-risk criteria. Patients who are overweight or obese, have a first-degree relative with diabetes, are of a high-risk ethnicity, have a history of cardiovascular disease or gestational diabetes, or are physically inactive are at increased risk for developing diabetes (ADA, 2018a). Additionally, individuals who have hyperlipidemia, hypertension, polycystic ovary syndrome, or signs of insulin resistance are of elevated risk and require further intervention and testing (ADA, 2018a).

The measurable clinical definition of obesity is a body mass index (BMI) greater than 30 when calculated by dividing a person's weight (kilograms) by squared height (meters) (ADA, 2018a). A waist circumference greater than 102cm and 88cm also indicates obesity for men and women respectively (Janssen, Katzmarzyk, & Ross, 2004). Aside from these quantifiable

attributes, obesity entails a number of associated features that have long-reaching effects on individuals' lives.

Although obesity can occur in the absence of correlated disease states, an obese individual has a greater risk of comorbidities that may be debilitating or fatal. The well-established fact is that “obesity harms virtually every aspect of health, from shortening life and contributing to chronic conditions such as diabetes and cardiovascular disease to interfering with breathing and mood” (de Ridder, Kroese, Evers, Adriaanse, Gillebaart, 2017, p. 913). When one considers the healthy overweight population it is important to note obese individuals have “an increased risk of all-cause mortality and cardiovascular diseases even without comorbid conditions” (Silina, Tessma, Senkane, Krievina, & Bahs, 2017, p. 262).

Therefore, the following describes the concept of obesity in the context of this particular project. Obesity is a state of metabolic impairment that is characterized by clinically measurable features such as BMI, waist circumference, and body composition. It is also correlated with increased mortality that is often related to comorbid conditions such as diabetes, cardiovascular disease, lipid abnormalities, and functional impairments. As a disease process, obesity has a profound impact on the individual's physical well being and emotional state and serves as a major risk factor for mortality.

Summary

Successfully implementing lasting organizational change entails overcoming barriers and setbacks. The application of a change theory aided in the anticipation of challenges and creating sustainable behavioral change. Kurt Lewin's field theory and three-step model of change helped practitioners seeking organizational change among health care providers.

Chapter Four: Pre-implementation Plan

A thorough and thoughtful assessment of readiness, risk, and evaluation methods is an important component of a project's pre-implementation plan. Ensuring the successful completion of any project depends on careful planning and analysis of potential challenges. By appraising the organization's readiness for change, the potential for risks, financial cost, and final outcome evaluation, a project manager can be adequately prepared to pursue the desired change.

Project Purpose

The purpose of the DNP Project was to implement a consistent diabetes screening and patient education protocol among providers in the clinic. There were no specific practice recommendations for addressing the risk for diabetes and subsequent care among patients who needed further treatment. By consistently applying the American Diabetic Association's screening and follow up guidelines, providers more effectively targeted the growing concern of diabetes in the population while better serving their patients.

Project Management

Organizational readiness for change. Implementing change within an organization in any capacity can have challenges. Assessing organizational readiness for change is an important step in ensuring a more successful and sustainable project. According to Timmings, Khan, Moore, et al., (2016) the four interacting constructs that determine an organization's readiness to implement change include individual psychological factors, individual structural factors, organizational psychological beliefs, and organizational structural considerations. Considering individual readiness in planning this project is of particular importance as the intervention relies on consistent execution by each clinician.

Individual psychological factors such as attitudes and beliefs were addressed by including participants in the project planning and encouraging discussion in the pre-implementation phase.

Seeking feedback when communicating the goals of the project allowed individuals to develop a sense of ownership for the process and facilitate adequate buy-in from the participants.

Individual structural factors were considered by making the implementation easy for the providers to incorporate into their established routines. Assessing individual structural characteristics such as a person's skills and knowledge determines the extent in which they may accept or reject the change (Timnings et al., 2016). Simply including the participants' feedback in the project design promoted a feeling of control and allowed them to suggest a streamlined design that would not interrupt their workflow.

Organizational psychological factors include organizational commitment and the ability to effectively carry out the change (Timnings et al., 2016). This aspect was determined to positively support the project's implementation when participants vocalized interest in completing the project as well as confidence in their ability to comply with directions. Assessing the organizational structural readiness was also important as it concerns office resources, staffing, and policies already in place. None of these aspects were deemed to be lacking or strained during the pre-implementation phase. Additionally, the project's design allowed for streamlined implementation by fitting into the established routine while requiring little to no work on the part of the auxiliary staff.

After a review of factors contributing to organizational readiness for change, it was determined that both individual factors and organizational characteristics supported the implementation of a new protocol. Based on the clinicians' verbal acceptance of the proposed project, management's interest in helping the project succeed, and the ability of other staff to take on additional tasks, the assessment favored a successful change in practices.

Inter-professional collaboration. The project had a single lead team member but relied on the collaboration of many to reach completion. Faculty advisors aided in the planning, directing,

and editing of the project from planning and pre-implementation phases throughout the duration of the intervention. The faculty lead can be credited for managing appropriate deadlines as well as lending their expertise and feedback to each step of the process. Additionally, the community leader, or in the case of this project, the collaborating physician served as a project champion and promoted the goals of the project lead throughout venture. The community leader was responsible for granting permissions as well as making time in the office to allow the project to take place. The practice's providers have been equally supportive in agreeing to host the DNP project and work towards its successful completion. The clinic's nurse and administrative staff provided additional support.

Risk management assessment. As defined by Aven in his 2016 article, *risk* is defined as the possibility of an unwanted occurrence, the potential for a negative consequence of an event, or uncertainties associated with an event. In conducting a risk management assessment one may plan for unexpected situations that would inhibit the project's goal or desired results. A typical risk assessment includes gaining familiarity with the organization and goals, identifying exposure to risk, assessing likelihood and severity of risks, implementing a management plan, and ongoing evaluation (Aven, 2016).

The project carried a very low risk for negative outcomes as a result of the patients receiving the screening or the providers conducting the intervention. There was no physical risk to either party and the intervention did not include risk greater than usual daily activities. With that in mind, determining factors that would impede the successful completion of the project was of secondary importance. Given the organizational environment, a potential risk that was not severe was unanticipated staffing changes. Without providers present in the office to assess new patients, screenings could not be conducted. The risk mitigation strategy included

communicating with staff regarding any planned scheduling changes in advance and extending the data collection period to accommodate for fewer than expected working days.

Additionally, assessing the strengths, weaknesses, opportunities, and threats of an intervention is a necessary component of project planning (Shahmoradi, Durrudi, Arji, & Nejad, 2017). Strengths of the proposed project included the simplicity of the screening tool, easy integration into established clinic routines, few additional resources required, and ease of collection. Potential weaknesses of this intervention were the challenge of organizational change, required preplanning and setup, the need for staff education, and reliance upon staff cooperation with a lack of reward for participation. Opportunities gained from the project were improved patient care, opening dialogue with patients regarding risk for diabetes, prevention of disease, and patient empowerment and education. Potential threats involved in the project were an absence of a precedent in establishing new office protocols, limited commitment of providers and office staff to the completion of the project, and the lack of project lead on-site presence for the entire duration of the project.

Strategies in place to counteract the limitations and threats to the project included adequate preparation and staff engagement, troubleshooting anticipated challenges with office staff and providers, and offering small group incentives at the completion of the project. Reinforcing the goals and purpose of the project was an important step in maintaining enthusiasm for the program, as well as encouraging the participants to contact the team lead with questions or concerns at any time, even if they are out of the office. Focusing on the positive attributes by reiterating the strengths and opportunities the project while proactively targeting the weaknesses and threats to the execution aided in successfully completing the quality improvement project.

Organizational approval. The supervising physician and the practice manager granted approval. The clinic is privately owned and benefits from a longstanding history of closely knit clinical and auxiliary staff. With these positive relationships already established, obtaining buy-in from practice leadership was easily accomplished. The clinicians valued evidence-based practices and meeting current guidelines and treatment goals. By prioritizing patient wellness through evidence-based screenings, the practice was able to offer better patient care. Written authorization for project implementation was given after initial discussion of the goals and purpose of the project and can be found in Appendix A. Further approval was granted by supervising faculty at East Carolina University after submitting plan details in full and is included in Appendix B.

Information technology. Results of the paper screening tools were entered into an electronic spreadsheet to analyze the project results. Data collected and documented during the designated period included the total number of new patients seen in the office, the number of patients screened, the number of patients deemed at-risk for disease, and the number of patients who received further counseling. The spreadsheet allowed for visualization of what percentage of patients received adequate and appropriate care during their initial visit in the clinic. Additionally, the spreadsheet highlighted gaps in data collection and identified individual providers' lack of compliance to instructions.

Cost Analysis of Materials. Project costs were minimal given the design and implementation plan. The cost of one 500-page ream of printer paper at \$3.00 sufficiently covered the patient education packets during the data collection period. The organization agreed to allow for printing at no cost to the project. Paperclips, pens, and miscellaneous office supplies were used as needed and supplied by the organization without direct cost to the project. All other material costs including in-office and online provider education sessions were negligible.

Plans for Institutional Review Board Approval

Institutional Review Board (IRB) Approval was sought via East Carolina University's online application portal. The project was deemed a quality improvement endeavor rather than research and was not subject to full IRB approval as noted in Appendix C. The organization did not require approval by a separate IRB.

Project Evaluation

Demographics. Demographic information collected included the provider's title (physician, nurse practitioner, or physician assistant) and years of experience in their current position. All other data collected pertained to the provider's actions, rather than their background. The intervention was intended to test whether providers successfully completed the ADA recommended screening tool for each new patient visit. Based on this goal, individual participant demographic information was not relevant to the outcome being measured.

Outcome measurement. The outcome tested was whether or not each eligible patient was considered for screening. With that goal, the number of patients for which diabetes screening was relevant was reported. Aside from the main objective of simply screening each new patient, it was useful to measure the number of patients who were at risk and given further information.

Evaluation tool. Participants were instructed to use the ADA's "Are you at Risk for Type 2 Diabetes?" test available online (see Appendix D). Providers used this tool to conduct diabetes screenings on each patient they saw for an initial encounter. Each completed screening tool was collected by the project manager and used for data analysis.

Data analysis. Data from the collected diabetes screening tools was entered into an electronic spreadsheet for analysis. Based on the project's primary objective the main outcome was measured on a "yes/no" basis and reported as a percentage. A visual depiction was created

representing how many patients were screened out of the total number of eligible patients seen during the data collection period.

Additionally, relevant information such as the percentage of patients who were found to be at risk for diabetes and the number of those patients who received further counseling was reported. The participants' demographic information was discussed separately from the outcome, as it is relevant to note any discrepancies in guideline adherence.

Data management. All collected data remained on site until the completion of the project. The project manager locked paper documentation in the office safe when not in immediate use. Additionally, the safe was kept in a locked room within the office. During non-business hours the clinic was protected by a security system.

The information from the paper copies of the screening tool was transcribed into an electronic spreadsheet that was locked with a password. A separate copy of this spreadsheet was stored on a second off site computer in the event the first was damaged or irretrievable. No identifying data was collected and there was no concern for breach of confidential information during the collection period. Hard copies of the screening information were kept until the completion of the project and were shredded by the project manager. No paper copies were retained at the end of the project. The electronic spreadsheet did not contain identifying or personal information and was maintained on two password protected computers.

Summary

The goal of the project was to initiate a consistent diabetes screening protocol among providers in a single setting. An assessment of organizational readiness supported the initiation of a quality improvement project to enhance clinician's compliance with ADA recommended guidelines. The results of a risk management analysis suggested there were many benefits to initiating screening among at-risk patients and revealed a number of weaknesses or threats that

could be proactively addressed to enhance the project's success. Approval for the project was obtained from the organization and IRB approval was sought soon thereafter. A timely completion of project planning, organization of regulatory requirements, and necessary guidance was achieved through inter-professional collaboration.

Information technology was utilized in analyzing the data collected from the ADA's Diabetes Risk Screening Tool by transcribing information into a spreadsheet and creating visual tables to depict results. The primary outcome of whether providers completed a screening on each patient was reported as a percentage. Additional relevant information included the percentage of patients who were found to be at risk for diabetes and the clinician demographics. Thorough planning in the pre-implementation phase aided in identifying weaknesses and challenges throughout the project.

Chapter Five: Implementation Process

The diabetes screening initiative focused on a single private practice located in the southeast. Implementation consisted of three phases, clinician education, data collection, and analysis. At the conclusion of the quality improvement project, information was compiled and assessed for the need for adjustments in the future.

Setting

The practice setting for the DNP project was a privately-owned which specialized in weight management and metabolic illness. Established in 2006, the office saw approximately 80 patients daily and employed a team consisting of a physician, a nurse practitioner, two physician assistants, two nurses, two dietitians, and administrative staff.

Participants

The project's implementation was focused directly on the providers seeing new patients in the practice: one physician, one nurse practitioner, and one physician assistant. Indirectly, all staff was involved in the quality improvement plan throughout the education and implementation phases. Any member of the clinical team who was interested in receiving pre-implementation education was eligible to receive training. The administrative staff received instructions before and intermittently throughout the intervention and served an important role by ensuring the new tools and paperwork were in place and readily available.

Criteria for selecting participants focused primarily on the staff person's role in the clinic. As the intent of the project was to capture patients who had not been screened for heightened diabetes risk, only providers who interacted with new patients were selected to receive the intervention. Those responsible for new patient intake in this practice included the physician, nurse practitioner, and physician assistant. Individuals who were not directly involved in patient care or education were excluded from the quality improvement project. Additionally, providers

and support staff who were primarily responsible for seeing established patients were not selected to participate in the intervention. Duration of employment, part-time employment status, educational background, or professional role was not exclusionary among the selected providers. All who were selected for participation freely agreed to participate without receiving incentives to do so.

Recruitment

Recruitment included in-person communication with eligible individuals to describe the intent, scope, and requirements of the project. Participants were given opportunities to ask questions, vocalize concerns, and develop a full understanding of the project's goals prior to agreeing to take part. As the project developed, the selected providers were updated on plans and anticipated timeline of implementation and completion. All participants vocalized agreement and consent upon beginning the project education and implementation phases.

Implementation Process

Implementation of the project included an educational session for the provider participants, a data collection period during which changes to the practice occur, and post-intervention analysis.

Education

Participants were asked to attend an in-person didactic session or an online presentation that introduced the risk for type 2 diabetes in the clinic's patient population. Following current published data and evidence-based research providers received a brief training session which described the severity of the disease, the rationale behind developing an office screening protocol, and the components of the project.

The session also included a detailed overview of the ADA screening tool that providers would use to screen all new patients as well as instructions regarding documentation upon

completion of the screening. Ancillary staff was invited to join the sessions to ensure the project's goals were clear to everyone who may be involved in the process. Questions were answered and all participating clinicians vocalized understanding of their role in the project.

During the intervention providers received reminders every other week regarding the rate of successful screenings in new patients and encouragement to provide feedback if there were noticeable barriers to completion. The continued support allowed the quality improvement project to remain a priority for clinicians and addressed ongoing concerns that arose.

Data Collection

Implementation of the screening tool and data collection began upon the completion of staff training. Screening tools from the ADA, a provider checklist, and patient education materials were automatically included with each new patient chart. The number of new patients entering the practice was noted daily and providers' initial assessment and visit notes were reviewed to determine if the patient received appropriate screening and education. Using the checklist provided to clinicians, it could be determined whether the patient was deemed "high risk" for diabetes based on their medical history and physical assessment. The interaction was determined to have a positive outcome if initial patients were screened for diabetes risk and if those who tested positive for elevated risk received educational materials.

Analysis

Results were compiled throughout the data collection period and analyzed at the completion of that phase. Information of interest included total number of new patients seen during the intervention period, total number of screenings completed, and total number of educational handouts given to new patients. Reviewing clinician notes aided in assessing whether screening and education was appropriately documented in the patient's chart.

Collected data was organized into a spreadsheet that allowed clear visualization of the total patients seen and the percentage of screenings that were correctly completed. Compiling the data by date also clearly depicted when providers had been more compliant to the request to screen and when they failed to provide screening.

Clinician feedback was elicited to determine what barriers or challenges prevented completion of the screening. Provider feedback was an important component of successful implementation throughout the process, but it was important to note their observations in order to improve upon the quality improvement initiative in the future.

Plan Variation

Variation to the planned project occurred as participants encountered barriers to successful implementation and offered feedback as to potential solutions. Providers suggested the educational materials be made available to all patients, regardless of health status or diabetes risk so that the screening itself was a less critical component of patient education. Given the health status of the majority of the practice's patients, providing information on prediabetes would be useful, but would not solve the problem of identifying at risk individuals and a medical provider appropriately addressed documenting the risk.

Additional factors that altered the planned course of the intervention included severe weather days, which closed the office and limited the number of new patient visits and an unusually high number of new patients in a given week due to office schedule changes.

Summary

The project's implementation process was a three-pronged approach that strongly relied on educational interventions. Working with the clinical and administrative staff was key to ensuring proper understanding of both the purpose of the project as well as their role in its successful completion. Secondly, educating the patients supported the goal of providing better

care by following recommended screening guidelines. Any quality improvement project requires adjustments and changes throughout implementation to achieve successful completion and some alterations were made. In the end project implementation was straightforward and concluded as planned.

Chapter 6: Evaluation of the Practice Change Initiative

Implementation of the diabetes screening quality improvement project occurred over a twelve-week period during which eligible providers were selected to receive the intervention. Three clinicians participated and screened a total of 151 patients over a period of twelve weeks. Data was collected weekly and evaluated at the completion of the project to determine if the practice changes and recommendations were effective.

Participant Demographics

Three clinicians were selected to directly participate in the quality improvement initiative focused on improving screening for diabetes during patients' initial visits. These three individuals were the only providers seeing new patients during the intervention and thus were the only eligible clinicians. The participants for this intervention were one physician, one nurse practitioner, and one physician assistant.

The physician was male, 50 years of age, and had been in practice since 2000 in other settings. He had 15 years of experience in this setting and was both the practice owner and supervising physician in the office. The nurse practitioner was female, aged 34, with nine years experience as a family nurse practitioner in this setting. The physician assistant was also female, 33 years old, and had worked in the current setting for 4 years. She had a background in internal medicine two years prior to her current position.

Intended Outcome

The intended outcome of this quality improvement project was to screen each new patient for his or her risk of developing type 2 diabetes using the ADA's published screening tool. Providers were encouraged to adopt a consistent and formalized protocol to screen patients for diabetes. By using the same tool to document each patient's risk for diabetes, providers would be better positioned to discuss, prevent, and manage patients' risk for chronic illness.

The short term intended outcome was to test whether providers could improve upon their clinical practice by consistently implementing and following ADA guidelines to screen patients for diabetes. Based on a 12-week trial of enacting this quality improvement project, clinicians found it was a reasonable and achievable goal to screen new patients upon intake. Participating providers stated the ADA screening tool was useful in practice and they could integrate screening into new patient visits during a post-implementation feedback session.

A long-term outcome of the project included putting policies and procedures in place to facilitate the continuation of patient screenings. By adding a simple tool to the new patient assessment providers were able to objectively gauge the patient's risk and offer recommendations for further action or treatment. Providers were able to become familiar with the screening tool and incorporate it into their practice during the 12-week intervention. In doing so they experienced the benefits to using the tool and stated they are more likely to continue using it in the future.

Findings

The number of new patients seen each week varied, ranging from six in the sixth week of the intervention to 22 in the third week of data collection. The physician saw the majority of the new patients and the nurse practitioner encountered the fewest number of new patients. The clinic saw a total of 152 new patients during this time.

At the completion of the intervention it was found 151 of 152 new patients were screened for their diabetes risk. The results indicated 99.34% of eligible patients were screened for diabetes risk using the ADA screening tool given to providers. Prior to project implementation no patients were formally or consistently screened at the initial appointment. Thus, the baseline number of patients evaluated prior to this intervention was zero, with an increase to 99.34% at the end of 12 weeks of data collection.

Patient Characteristics. The ADA patient screening tool yields a risk score for each patient screened for diabetes risk and may be found in Appendix D. Patients who had a score of 5 or greater were considered to have an elevated risk, while those with a score of less than 5 did not require further intervention. Upon completion of the data collection period, 46.35% of patients screened were found to be at increased risk for having type 2 diabetes. Figure 1 depicts the collective results of the screening tool.

Figure 1. Compiled Results

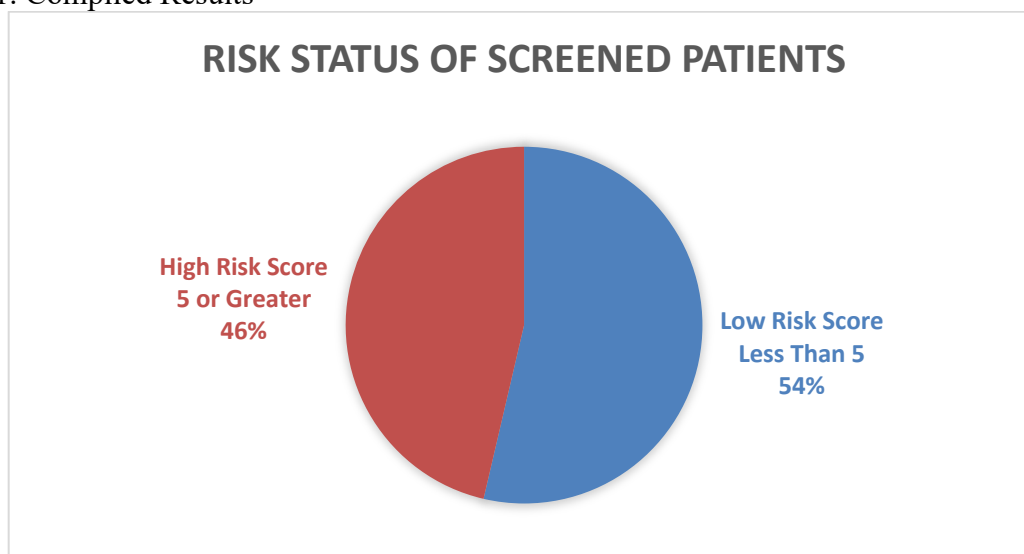


Figure 1. Compiled patient scores and percentages

Post-intervention Feedback. Rationale for failure to screen was evaluated at the completion of the data collection period. Providers were asked open-ended questions to determine why some patients were not screened for diabetes. Clinicians cited time constraints, assumptions about patients' health status, and simply forgetting to complete paperwork during the visit as barriers to screening. Because personal identifying data was not collected, it was not possible to determine which single patient was not screened during the quality improvement project.

Providers also expressed surprise at the number of patients who were at elevated risk for diabetes at the time of screening. They noted there were many more patients who would benefit

from counseling and early treatment than they had anticipated. One clinician stated they would begin developing an early treatment protocol for patients at high risk for type 2 diabetes since so many of their clients would likely benefit. The nurse practitioner admitted she assumed some patients would not require screening, as they did not fit the presumed appearance of someone at high risk for diabetes, only to find they were at risk after conducting their initial exam.

The benefit of the ADA survey was that it was brief and simple to use. The providers felt it was appropriate and short enough that it did not impede upon their time with the patient. The tool was previously validated and has been adapted by the ADA to accurately reflect patient risk for diabetes (ADA, 2018b). The downfall of the screening tool is that it does not distinguish between patients who have previously been diagnosed with prediabetes or diabetes. Providers noted some patients being screened had either been diagnosed with prediabetes already or reported a history of prediabetes. The screening tool was still utilized in these situations but left the provider unsure of the patient's status if they had a low risk score but a positive history of diabetes.

Implications for Practice. The project participants all had positive responses to initiating a screening protocol for new patients. Given the patient population's elevated risk for diabetes and weight-related diseases, clinicians agreed the tool was useful and could benefit patient care in the future. Providers noted they were more likely to initiate discussions regarding diabetes risk, preventative care, and further testing during the project implementation period because they were more aware of the patients' risk for developing the disease. The providers also agreed they were more likely to appropriately treat prediabetes and the early stages of diabetes when they had appropriately assessed and documented a patient's risk status.

Summary

Initiating an office-wide protocol that encouraged providers to consistently screen and educate patients regarding their risk of type 2 diabetes was an effective method of testing new patients. Formalized screening for diabetes increased by 99.34% during the 12-week implementation period. It was important to note that 46.35% of patients entering the practice scored high enough on the ADA's diabetes risk screening to warrant further action. A continued practice of screening each new patient may be beneficial given the rates of high-risk patients regularly joining the clinic.

Engaging in open-ended discussions with providers regarding their perceived barriers, assumptions, and recommendations for change was useful in evaluating the downfalls of failing to consistently screen patients. It also paved the way for managing any concerns and improving upon the quality improvement project for implementation in the future.

Chapter 7: Implications for Nursing Practice

The consistent application of screening guidelines is an important and necessary tool for doctorally prepared nurses who strive to improve patient care. Advanced practice nurses continue to take a greater role in managing patients' wellness and should create opportunities to utilize tools that offer early detection of illness. This chapter will address practice implications and future applications to the guidelines that govern the Doctor of Nursing Practice role.

Practice Implications

The ADA recommends screening patients for elevated diabetes risk and referring qualified patients for further testing (ADA, 2018a). Without a standardized diabetes screening protocol, providers fail to consistently address patients' risk (Phillips et al., 2014). The ADA offers a simple screening tool that may be used by providers and patients alike to determine elevated risk of developing type 2 diabetes based on medical history and physical examination findings. The results of this project suggest providers may easily incorporate this screening tool into their practice to address patient risk status. The project employed a number of DNP practice guidelines to improve the quality of care offered in the practice.

The American Association of Colleges of Nurses (AACN) details the educational competencies of the doctorally prepared nurse known as the DNP Essentials (American Association of Colleges of Nurses [AACN], 2006). These guidelines structure the DNP curriculum to encourage enhanced nursing practice, leadership, and the use of evidence-based methods to improve outcomes (AACN, 2006). This quality improvement project was tied to the AACN's DNP Essentials as outlined below.

Essential I: Scientific Underpinnings for Practice

The DNP curriculum encourages drawing from multiple scientific foundations and research from a variety of areas to offer holistic and complex care of individuals throughout the

lifespan (AACN, 2006). The first DNP Essential also encourages the use of scientific and theoretical frameworks to support nursing practice (AACN, 2006). Literature suggests early diabetes screening and treatment is critical to improved patient outcomes and the U.S. Preventive Services Task Force recommends routine screening for diabetes (Phillips et al., 2014; U.S. Preventative Services, 2015). Screening patients for their risk at the initial visit and annually thereafter follows current guidelines and recommendations.

Essential II: Organizational and Systems Leadership

The second DNP Essential prepares graduates to conceptualize innovative and feasible methods to provide care in today's economic, political, and cultural climate (AACN, 2006). Nurse practitioners in leadership roles are tasked with balancing organizational priorities and quality care. Conducting an assessment of organizational readiness prior to initiating any significant change supports the success of a quality improvement project. This project applied Lewin's model of change to implement a diabetes screening protocol, which provided a theoretical model to guide nursing leadership.

Lewin's field theory suggests individual behavior is influenced by their environment and the organizational culture should be considered when enacting change (Batras, Duff, & Smith, 2016). The project was implemented following Lewin's three phase process of unfreezing current thoughts, modifying individual actions, and then refreezing behaviors to create organizational change (Batras, Duff, & Smith, 2016). Educating nurses to effectively analyze system needs, identify areas which require change, and then create equitable solutions is an important component of the DNP program.

Essential III: Clinical Scholarship and Analytical Methods for Evidence-Based Practice

A hallmark of the DNP education is the ability to ascertain, interpret, and apply current research to clinical problems. The third DNP Essential promotes the use of evidence-based

research across many disciplines to solve complex healthcare concerns (AACN, 2006). The most efficacious plan for addressing high rates of undiagnosed prediabetes was developed by conducting a thorough literature review and assessing the quality of information available. Once the current material was evaluated a research-based screening tool was chosen to promote a consistent screening protocol in one practice. In doing so, this project was able to use online databases to identify solutions, design evidence-based interventions, examine outcomes, and identify further needs for change in practice (AACN, 2006).

Essential IV: Technology for the Improvement and Transformation of Health Care

The AACN advocates for the use of information systems and technology to promote financial planning and budgeting, effective communication, healthcare analytics, and data analysis (AACN, 2006). Nurse leaders who gain technological expertise are better prepared to move forward in an increasingly technology dependent climate. More importantly, DNP professionals benefit from proficiency in data processing and analyzing project results.

Future endeavors to implement screening protocols within an office would benefit from the use of an electronic health record (EHR). Electronic charting would allow for a more seamless transition when adopting a screening tool as users would be automatically prompted to complete the evaluation during their initial assessment. The ADA's diabetes risk tool would work well within an EHR as it quickly offers a calculation of the patient's risk and could be saved to the electronic chart.

Implementing new screening policies requires data collection and knowledge of information technology to analyze and compare results. Baseline screening rates were compared to post-intervention rates and patients' rates of risk for developing diabetes were compiled to direct future care. It was found that nearly half of the patients seen in the practice were

candidates for further testing based on their risk profiles. Data analytics assisted in arguing for continued screening and additional care for these individuals.

The use of spreadsheet software is vital in budgeting for expenses and analyzing results of the data collected when pursuing similar quality improvement projects. This initiative benefited from very reasonable financial expenditures and a modest budget which required only basic technology to calculate. When implementing projects with a broader scope, a spreadsheet to manage cost and materials would become necessary.

Essential V: Health Care Policy for Advocacy in Health Care

Doctorally prepared nurses have a commitment to political activism and policy development (AACN, 2006). The fifth DNP essential incorporates the need for nursing leadership at local and national levels as graduates may become important influencers in the formation of health policy (AACN, 2006). This project required the DNP leader to be familiar with nationally recognized guidelines, have knowledge of current policies affecting recommendations, and have the foresight to acknowledge impediments to project success. Understanding and managing the current climate of diabetes stigma, diagnostics, and treatment options allows providers to more effectively care for their patients who may be at risk for the disease.

Essential VI: Interprofessional Collaboration for Improving Health Outcomes

The DNP curriculum prepares nurses to work within interdisciplinary teams to achieve the best possible health outcomes (AACN, 2006). It continues to be critical for nursing leaders to communicate and collaborate with professionals in a variety of healthcare arenas to achieve both short and long term goals. Analyzing prior research and work by professionals in other industries is key to selecting evidence-based solutions when conducting a literature review.

Implementing policy change within an office setting requires diplomatic relationships with those who are financially vested in the success of the practice, those who are long-term stakeholders and may be reluctant to change, and providers who have little time or patience for impediments to their practice. Thoughtful collaboration with individuals affected by change is an important step towards the project's success.

This project's success depended on support from a number of stakeholders within the practice. The collaborating physician was also the business owner and served as the project's community leader. His ongoing and enthusiastic support encouraged other providers in the office to dedicate time and energy to the intended practice change. Clear and effective communication with all ancillary staff was vital in continuing the intervention over the twelve-week period. Nursing colleagues played an integral role in project development and presentation. Lastly, close work with program faculty was necessary in laying the academic groundwork, analyzing current research, and assessing the project's outcomes.

Essential VII: Clinical Prevention for Improving the Nation's Health

The DNP prepared nurse is focused on both the health maintenance and reduction of risk in the population while being mindful of the larger aggregate components of population health (AACN, 2006). It is not enough to manage patients' illnesses and simply treat the disease. DNP nurses work to actively promote wellness in the absence of disease and enact preventative measures to maintain optimal functioning of the population. This requires knowledge of epidemiological data, the surrounding environment, infectious diseases, emergency preparedness, and preventative medicine (AACN, 2006). This project focused heavily on the prevention of a progressive and devastating disease. The population suffers from high rates of undiagnosed diabetes that results in a delay of diagnosis, care, and treatment of sequelae (CDC, 2017). In encouraging providers to screen for disease risk, patients have the opportunity to take

early action and prevent the onset of disease. Particularly in chronic illness, health maintenance and preventative measures are crucial to individual wellbeing as well as population health.

Essential VIII: Advanced Nursing Practice

Finally, the eighth ENP essential addresses the rigorous clinical education and practical knowledge each DNP prepared nurse achieves. Given the complexities of today's healthcare system and specialty practice, each DNP graduate is prepared to enter specialty practice based on their training (AACN, 2006). Their clinical expertise is derived from training in a variety of medical settings and among a number of specialized practices (AACN, 2006). This also allows the DNP to collaborate with professionals in a variety of settings and organizational roles.

The DNP is required to use their comprehensive educational background to plan, assess, diagnose, develop treatment plans, and consider preventative measures in their clinical work. Additionally, the nurse leader must use their knowledge of organizational cultures, financial needs, policy change, and patient advocacy to navigate the corporate climate of the healthcare system. This is perhaps the most important DNP essential as it touches on each aspect of the DNP's educational and clinical experience.

Summary

The AACN has published eight core essentials to guide the doctorally prepared nurse's education and practice. The DNP is proficient in these competencies that promote scientific research, evidence-based decision making, the use of technology, an understanding of organizational structure, political advocacy, interprofessional collaboration, preventative care, and full utilization of advanced nursing practice. Quality improvement projects implemented by DNP graduates draw on each of these guidelines to enact change in their organization. Only with attention to each of these areas will the nursing leader utilize their full scope of practice and prove to be an expert in their field.

Chapter 8: Final Conclusions

This quality improvement initiative directed at instituting a screening protocol for type 2 diabetes yielded positive results as well as further practice implications. There were both strengths and weaknesses identified when assessing the final project. Most importantly, the project highlighted a number of benefits related to consistently screening patients for their risk status. The following chapter will summarize the project findings and recommendations for change.

Significance of Findings

The intended outcome of this project was to establish an evidence-based diabetes screening protocol for providers in a private practice. The goal was to aid practitioners in consistently identifying patients who would benefit from further diabetes testing and education. The intervention targeted three providers who were asked to use a diabetes risk assessment with each new patient they encountered over a twelve-week period. There were no screening policies in place prior to the project and no significant documentation of risk status. The providers successfully used the screening tool with 99.34% of incoming patients during the course of the project and found 46% of patients were at increased risk for type 2 diabetes.

The project's findings are significant in that they suggest the participating providers are capable of adopting a screening protocol with a greater than 99% success rate. The clinicians underwent a single educational session and required no formal reminders to continue the practice change. Additionally, just less than half of the incoming patients were found to have a high risk for developing type 2 diabetes. These patients were given resources for prevention and treatment of the disease. Literature suggests that the most successful interventions targeting type 2 diabetes occur in the early stages of disease when lifestyle modifications and medications have the greatest impact (Phillips et al., 2014).

Project Benefits

Successful implementation of this project yielded a number of benefits. Adopting a screening protocol complies with treatment guidelines put forth by nationally recognized organizations such as the American Diabetes Association, the U.S. Preventative Services Task Force, and the Centers for Disease Control (ADA, 2018a; USPSTF, 2015; CDC, 2017). Healthy People 2020 acknowledges diabetes is one of the most significant threats to the nation's health and includes at least sixteen objectives to improve disease management (Department of Health and Human Services, 2019). Providers who appropriately screen patients for diabetes risk contribute to the goal of increasing the proportion of persons with diabetes whose condition has been diagnosed as well as the objectives of formally educating those at risk and advising lifestyle changes (Department of Health and Human Services, 2019).

Secondarily, screening and educating patients regarding their risk for diabetes encourages self-efficacy in prevention and treatment. Individuals who are made aware of their risk and who are given resources to further educate and pursue treatment are better equipped to manage their health and well-being. Consistent screening opens a conversational window between provider and patient even if a patient is not found to be high risk or chooses to forgo further testing.

Most tangibly, a cost-benefit analysis may be applied to preventing a patient's progression to prediabetes or type 2 diabetes. Zhuo and colleagues (2014) estimate the lifetime cost of diabetes is \$211,400 for a single patient. During the twelve-week intervention 69 of the 150 patients screened were found to have an elevated risk for type 2 diabetes. Implementing the screening intervention is essentially free of cost. The ADA's diabetes risk tool is free to use and including the additional screening to new patient visits did not add any additional expense. Screening, educating, and potentially modifying a patient's disease trajectory has significant fiscal implications.

Project Strengths and Limitations

The project's straightforward implementation and simple design contributed to its greatest strengths. Evidence-based solutions found in the literature guided the quality improvement initiative and eliminated complicated or unproven techniques to implement the screening protocol. The single outcome concerned the clinicians' ability to consistently use a one-page screening tool with each new patient. It was simple to evaluate the outcome and to review the collected data at the end of the project. Additionally, the clear instructions were easy to understand and implement by all personnel involved. The directions to both clinicians and ancillary staff participating in the plan were straightforward and did not change over the course of the intervention.

The intervention was inexpensive to design and implement and included office supplies already available. The ADA's diabetes screening tool was free to use and is easily accessible online to clinicians and patients alike. Because the office did not use an EHR there was no need to alter electronic templates or program for the screening tool. Including the one-page tool with each new patient's incoming paperwork was simple, cost effective, and not cumbersome to staff. Additionally, the willingness of the staff and providers to fully participate contributed to the project's success. Buy-in from all parties was easily achieved and the medical director served as a strong community chair and encouraged collaboration among staff.

Project weaknesses included lack of constant oversight by the project leader and inconsistent communication with support staff. Though the providers successfully complied with the screening protocol the vast majority of the time, the front office staff received insufficient training and follow-up regarding their role in the project. Paper copies of the patient educational materials ran out twice and were not readily available to patients or clinicians. The project lead was present in the office once weekly during the first eight weeks of implementation

and was available by phone or email for the remainder of the data collection period. Participants freely asked questions and sought clarification in-person during office hours but did not reach out while the lead was out of the office. Consistent communication would have been facilitated by maintaining direct contact throughout the project.

While the project challenged providers to be consistent in appropriately screening their patients for diabetes risk, it was not able to address ongoing change or long-term benefits of screening. It is unknown if the high rate of adherence is sustainable over a longer course of time. Without consistent feedback and encouragement the clinicians may fail to achieve such high screening rates on an ongoing basis. Also, the project was not designed to revisit patient status in the future to determine the usefulness of screening. Following up with patient behavior modifications or recommended laboratory screening was not feasible due to the relatively brief data collection period and patient anonymity.

Recommendations for Practice

The DNP project to implement a diabetes screening protocol in a busy private practice may be replicated in other settings with few alterations. Research suggests medical providers are more likely to appropriately screen their patients for disease after a single educational session encouraging them to do so (Mainous et al., 2016). Very little cost or labor is involved in screening patients during an initial assessment and documenting patient risk status.

The ADA offers free diabetes risk assessment tools and educational materials online that may be printed or completed electronically. Practices that are not interested in having clinicians complete the screening may give the risk assessment tool directly to the patients to complete. Tools are currently available online that immediately score the individual's risk and directs them to online resources for further education and care. This may be the most effective way to increase patient awareness and self-efficacy without adding to a provider's workload.

This quality improvement project may be replicated in a variety of settings. The ADA's Diabetes Assessment is simple to conduct and score and is freely available to clinicians and patients alike. Clinics of any size could benefit from its utilization as well as other locations that promote preventative medicine and disease awareness. It is likely a similar protocol may be adopted by practices interested in screening for other modifiable diseases as well. Diabetes is one of many chronic conditions that may be addressed in the early stages if patients are screened appropriately. Offices may follow these guidelines to target preventable illness as well as encourage behavioral change.

It is recommended this project's outcomes be disseminated among the current participants within the medical practice to gather feedback and complete the full intervention with a PDSA cycle. Additionally, it should be published among the academic institution's database of scholarly DNP projects for review and future access. The material is suitable for presentation among audiences interested in preventative medicine, prediabetes and diabetes care, office policy and protocols, as well as quality improvement initiatives in clinical arenas.

Future projects building upon this screening protocol may explore rates of laboratory testing for type 2 diabetes based on national guidelines. The available literature suggests patients are not appropriately screened or tested for the disease and may continue for years without treatment or intervention (Phillips et al., 2014). Recording and analyzing laboratory markers for disease following an in-office screening would yield important information that may persuade clinicians to consistently test patients for prediabetes and diabetes.

Sustained behavioral change and compliance to the screening protocol requires ongoing assessment and adjustments as potential challenges arise. A future project may assess clinicians' compliance rates over a greater period of time. Methods to ensure sustainability may include making screening tools a permanent part of intake paperwork or building them into the EHR as

an item that must be completed during patient assessment. Assimilating the new initiative into clinicians' current workflow and routine would increase the likelihood of continued success.

Final Summary

The number individuals unknowingly living with type 2 diabetes is substantial and the risk of failing to treat the disease early is significant. The fact that that many clinicians fail to recognize and address their patients' risk for diabetes suggests interventions that promote adequate attention to prediabetes are necessary. The scope of the problem indicates many patients would benefit from appropriate screening techniques as well as prompt action in order to curb the impact of their disease. A single education session with health care staff may improve adherence rates to screening guidelines. Many clinical arenas could benefit from establishing testing protocols given the low cost of intervention compared to the staggering cost and consequences of the disease nationwide.

This evidence-based quality improvement project aimed at identifying patients at risk for type 2 diabetes by establishing a screening protocol was effective and easy to implement. Consistently screening and documenting patients' risk for disease provided concrete data which could guide providers' interventions and conversations with their patients. Prior to implementing a screening protocol, providers may have discussed diabetes as they deemed necessary. By using the ADA's screening tool clinicians were able to offer patients evidence of risk and begin dialog regarding prevention and behavior modification.

The use of a research-based screening tool brought the office into compliance with recommendations established by nationally recognized organizations. Because the clinic predominantly treated patients with multiple risk factors for diabetes it was important that they develop a protocol to address the potential for developing diabetes and educate their population

appropriately. Continued use of the ADA's diabetes risk tool encourages providers to permanently integrate screening into their practice.

The benefits of identifying and treating diabetes early in the course of the disease are significant. Implementing lifestyle, behavior, and diet modifications as soon as risk for illness is suspected can alter the trajectory of a patient's wellbeing for the rest of their lives. Instituting a policy of consistent screening is not only cost effective in terms of treatment and early intervention but it could provide years of improved quality of life for individuals at risk. All patients could benefit from an increased focus on preventative health and measures to reduce chronic disease.

References

- American Association of Colleges of Nurses (2006). The essentials of doctoral education for advanced nursing practice. 1-28. Retrieved from <http://www.aacnursing.org/Portals/42/Publications/DNPEssentials.pdf>.
- American Diabetes Association (2018a). 2. Classification and diagnosis of diabetes: Standards of Medical Care in Diabetes—2018. *Diabetes Care*. 41(Suppl. 1), S13–S27. <https://doi-org.jproxy.lib.ecu.edu/10.2337/dc18-S002>
- American Diabetes Association (2018b). Type 2 diabetes risk test. Retrieved from <http://www.diabetes.org/are-you-at-risk/diabetes-risk-test/>
- Almeida, F. A., Shetterly, S., Smith-Ray, R. L., & Estabrooks, P. A. (2008). Reach and effectiveness of a weight loss intervention in patients with prediabetes in Colorado. *Prevention Chronic Disease*. 7(5). A103.
- Aven, T. (2016). Risk assessment and risk management: Review of recent advances on their foundation. *European Journal of Operational Research*, 253(1), 1-13. doi:10.1016/j.ejor.2015.12.023
- Bailey, K. J., Little, J. P., & Jung, M. E. (2016). Self-monitoring using continuous glucose monitors with real-time feedback improves exercise adherence in individuals with impaired blood glucose: A pilot study. *Diabetes Technology & Therapeutics*. 18(3), 185-193. doi: 10.1089/dia.2015.0285.
- Batras, D., Duff, C., & Smith, B. (2016). Organizational change theory: Implications for health promotion practice. *Health Promotion International*. 31(1). 231-241. <https://doi.org/10.1093/heapro/dau098>

- Bergman, M. (2014). The early diabetes intervention program – is early actually late? *Diabetes Metabolism Research and Reviews*. 30(8). 654-658. <https://doi-org.jproxy.lib.ecu.edu/10.1002/dmrr.2563>
- Centers for Disease Control and Prevention (2017). National diabetes statistics report, 2017. Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services. Retrieved from <http://www.diabetes.org/assets/pdfs/basics/cdc-statistics-report-2017.pdf>
- Centers for Disease Control and Prevention (2018). National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation. Retrieved from cdc.gov/diabetes/atlas.
- Curran, V. R., Hollett, A., Allen, M., Steeves, J., & Dunbar, P. (2008). A continuing medical education needs assessment of primary care physicians' knowledge and awareness of prediabetes care. *Canadian Journal of Diabetes*. 32(4). 273-280.
- de Ridder, D., Kroese, F., Evers, C., Adriaanse, M., & Gillebaart, M. (2017). Healthy diet: Health impact, prevalence, correlates, and interventions. *Psychology & Health*, 32(8), 907. doi:10.1080/08870446.2017.1316849
- Department of Health and Human Services (2019). Diabetes. *Healthy People 2020*. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/diabetes/objectives>
- Dotinga, R. (2017). Red flags for type 2 diabetes seen 25 years before diagnosis. *Clinical Endocrinology News*. Retrieved from <https://www.mdedge.com/clinicalendocrinologynews/article/141702/diabetes/red-flags-type-2-diabetes-seen-25-years-diagnosis>
- Guess, N. D., Caengprasath, N., Dornhorst, A., & Frost, G. S. (2015). Adherence to NICE guidelines on diabetes prevention in the UK: Effect on patient knowledge and perceived risk. *Primary Care Diabetes*. 9(6), 407-411. doi: 10.1016/j.pcd.2015.04.005.

- Huang, E.S., Basu, A., O'Grady, M., & Capretta, J. C. (2009). Projecting the future diabetes population size and related cost for the U.S. *Diabetes Care*. 32(12). 2225-9. Doi: 10.2337/dc09-0459.
- International Diabetes Federation (2017). *IDF Diabetes. 8th ed.* Brussels, Belgium: International Diabetes Federation. Retrieved from <http://www.diabetesatlas.org>.
- Janssen, I., Katzmarzyk, P. T., & Ross, R., (2004). Waist circumference and not body mass index explains obesity-related health risk. *American Journal of Clinical Nutrition*. 74: 379-384.
- Kramer, M. K., McWilliams, J. R., Chen, H. Y., & Siminerio, L. M. (2011). A community-based diabetes prevention program: evaluation of the group lifestyle balance program delivered by diabetes educators. *Diabetes Education*. 37(6), 659-668. doi: 10.1177/0145721711411930.
- Lawlor, M. S., Blackwell, C. S., Isom, S. P., Katula, J. A., Vitolins, M. Z., Morgan, T. M., & Goff, D.C. (2013). Cost of a group translation of the Diabetes Prevention Program: Healthy Living Partnerships to Prevent Diabetes. *American Journal of Preventative Medicine*. 44(4), S381-389. doi: 10.1016/j.amepre.2012.12.016.
- Lewin K. (1997). *Resolving social conflicts and field theory in social science*. American Psychological Association, Washington, DC.
- Lewin, K., & Lewin, G. W. (1948). *Resolving social conflicts: Selected papers on group dynamics* (1st. ed.). New York: Harper.
- Li, R., Shrestha, S. S., Lipman, R., Burrows, N. R., Kolb, L. E., & Rutledge, S. (2014). Diabetes self-management education and training among privately insured persons with newly diagnosed diabetes--United States, 2011-2012. *Centers for Disease Control and Prevention Morbidity and Mortality Weekly Report*. 63(46), 1045-1049.

- Mainous, A. G., Tanner, R. J., Scuderi, C. B., Porter, M., & Carek, P. J. (2016). Prediabetes screening and treatment in diabetes prevention: The impact of physician attitudes. *Journal of the American Board of Family Medicine*, *29*(6), 663-671. doi: 10.3122/jabfm.2016.06.160138.
- Murray, N. J., Gasper, A. V., Irvine, L., Scarpello, T. J., & Sampson, M. J. (2012). A motivational peer support program for type 2 diabetes prevention delivered by people with type 2 diabetes: the UEA-IFG feasibility study. *The Diabetes Educator*, *38*(8), 366-376. doi: 10.1177/0145721712440332
- National Center for Health Statistics (2017). Health, United States, 2016: With chartbook on long-term trends in health. *Centers for Disease Control and Prevention*. Retrieved from <https://www.cdc.gov/nchs/data/hus/hus16.pdf#019>
- Nhim, K., Khan, T., Gruss, S. M., Wozniak, G., Kirley, K., Schumacher, P., . . . Albright, A. (2018). Primary care providers' prediabetes screening, testing, and referral behaviors. *American Journal of Preventive Medicine*, *55*(2), e39-e47. doi:10.1016/j.amepre.2018.04.017
- Phillips, L. S., Ratner, R. E., Buse, J. B., & Kahn, S. E. (2014). We can change the natural history of type 2 diabetes. *Diabetes Care*, *37*(10), 2668-2676. DOI: 10.2337/dc14-0817
- Pippitt, K., Li, M., & Gurgle, H.E. (2016). Diabetes mellitus: Screening and diagnosis. *American Family Physician*, *93* (2), 103-109.
- Rariden, C. A., Lavin, M. A., & Yun, S. (2015). Improving prediabetes screenings at rural Missouri county health departments. *Journal of Community Health*, *40*(6), 1107-1114. doi:10.1007/s10900-015-0036-y
- Shahmoradi, L., Darrudi, A., Arji, G., & Ahmadreza, F. N. (2017). Electronic health record implementation: A SWOT analysis. *Acta Medica Iranica*, *55*(10), 642-649. Retrieved

from

<http://search.proquest.com.jproxy.lib.ecu.edu/docview/1982952727?accountid=10639>

Silina, V., Tessma, M. K., Senkane, S., Krievina, G., & Bahs, G. (2017). Text messaging (SMS) as a tool to facilitate weight loss and prevent metabolic deterioration in clinically healthy overweight and obese subjects: A randomised controlled trial. *Scandinavian Journal of Primary Health Care*, 35(3), 262-270. doi:10.1080/02813432.2017.1358435

Skyler, J. S., Bakris, G. L., Bonifacio, E., Darsow, T., Eckel, R. H., Groop, L., . . .

Lundsuniversitet. (2017). Differentiation of diabetes by pathophysiology, natural history, and prognosis. *Diabetes*, 66(2), 241-255. doi:10.2337/db16-0806

Thomas, G. N., Jiang, C. Q., Taheri, S., Xiao, Z. H., Tomlinson, B., Cheung, B. M., . . . Cheng, K. K. (2010). A systematic review of lifestyle modification and glucose intolerance in the prevention of type 2 diabetes. *Current Diabetes Review*. 6(6), 378-287.

Timmings, C., Khan, S., Moore, J. E., Marquez, C., Pyka, K., & Straus, S. E. (2016). Ready, set, change! development and usability testing of an online readiness for change decision support tool for healthcare organizations. *BMC Medical Informatics and Decision Making*, 16doi:<http://dx.doi.org.jproxy.lib.ecu.edu/10.1186/s12911-016-0262-y>

Tuso, P. (2014). Prediabetes and lifestyle modification: Time to prevent a preventable disease. *The Permanente Journal*. 18(3), 88-93. doi: 10.7812/TPP/14-002.

U.S. Preventive Services Task Force (2015). Final update summary: Diabetes mellitus (type 2) in adults: Screening. Available from <https://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/diabetes-mellitus-type-2-in-adults-screening>

Vadheim, L. M., McPherson, C., Kassner, D. R., Vanderwood, K. K., Hall, T. O., Butcher, M. K., Helgersson, S. D., & Harwell, T. S. (2010). Adapted diabetes prevention program

lifestyle intervention can be effectively delivered through telehealth. *The Diabetes Educator*. 36(4), 651-656. doi: 10.1177/0145721710372811

Zhuo, X., Zhang, P., Barker, L., Albright, A., Thompson, T. J., Gregg, E. (2014). The lifetime cost of diabetes and its implications for diabetes prevention. *Diabetes Care*. 37(9). 2557-2564. doi: 10.2337/dc13-2484.

Zimmet, P. Z. (2017). Diabetes and its drivers: The largest epidemic in human history? *Clinical Diabetes and Endocrinology*, 3.doi:10.1186/s40842-016-0039-3

Appendix A
Clinical Site Letter of Support

July 12, 2018

To Whom It May Concern

We at [REDACTED] have reviewed Allison Ernst's DNP Project title "Diabetes Screening in the Obese Patient." Mrs. Ernst has organizational support and approval to conduct her project within our institution. We understand that for Mrs. Ernst to achieve completion of the DNP program, dissemination of the project will be required by the University, which will include a public presentation related to the project and a manuscript submission will be encouraged.

Our organization has deemed this project as a quality improvement initiative and not requiring institutional IRB review.

Thank you

Signature and title

Appendix B

Letter of Institutional Support

ECU CON DNP PROJECT EVALUATION

Student: Allison Ernst Course Faculty: Dr. [REDACTED] Date of Review: 7.9.2018 Review Type: **Mid Term** or **Final** Project
 Title: Implementing Diabetes Screening in the Obese Population Project Site: [REDACTED]

DNP Projects should be designed so that processes and/or outcomes will be evaluated to guide practice and policy and address all the DNP Essentials. Clinical significance is as important in guiding practice as statistical significance is in evaluating research. All Criteria must be met for student to progress to NURS 8272 DNP Project II.

Criteria	Met	Not Met	Unclear	Rationale
1. Is the project feasible and realistic within the timeframe of the program of study?	X			Planning to be completed Fall 2018. Staff training x3 weeks in 12/2018. Eight week implementation in Spring 2019.
2. Is there evidence to support the need for the project at the specific site?	X			Literature and national guidelines heavily support screening at risk populations. Practice lacks screening protocol.
3. Does the project include a theoretical framework for implementation?	X			Model of change among staff members, supported by Lewin's Three Step Model of Change
4. Is the project supported by evidence provided through existing scholarly literature?	X			Through literature review. Upheld by national organizations issuing recommendations.
5. Does the project focus on a change that impacts healthcare outcomes either through direct or indirect care/clinical practice?	X			Through direct clinical practice; implementation requires provider screen and educate patients.
6. Will the project solve systems or practice problems or directly inform clinical practice?	X			Practice not currently following national standards and guidelines sees patients who would benefit from education.
7. Does the project have a systems (micro-, meso-, or macro- level) or population/aggregate focus? (Intended project population clearly defined)	X			Micro level focus of providers employed at clinical site.
8. Does the project demonstrate implementation in the appropriate setting or area of practice? Site letter of support is required prior to final approval)	X			Practice exclusively sees and treats at-risk population for diabetes and comorbidities.
9. Does the project address outcomes associated with the Triple Aim and/or Healthy People 2020?	X			Diabetes treatment and prevention. Obesity treatment and prevention. Healthy behaviors and lifestyle change.
10. Does the project include proposed overall measureable outcomes?	X			Chart review to indicate whether screening was accomplished; a Yes/No outcome.
11. Does the project provide a foundation for future practice scholarship and interprofessional leadership?	X			Development of clear and consistent screening and treatment protocols. Prepares practice for dev of treatment protocols.

DNP I Faculty comments/discussion: **Met 100%** OR **Did not meet 100%**. Explain:

Action Plan: What does the student need to do to meet the unmet needs? Student action plan should include the specific areas needing additional development with specific dates of completion. Student will continue to refine the project proposal until approved:

Faculty Reviewer Signature: [REDACTED] Signature: _____ Date: 07/13/2018

As the DNP Program Director, I have reviewed this project and **Approve** OR **Do not approve** this project.

Comments:

Program Director Signature: [REDACTED] Date: 07/13/2018

Appendix C

Survey for IRB Approval



Click "download PDF" to save a copy of this page for your records.
Note: The IRB Office does not maintain copies of your responses.

Below is a summary of your responses

[Download PDF](#)

Quality Improvement/Program Evaluation Self-Certification Tool

Purpose:

Projects that do not meet the federal definition of human research pursuant to 45 CFR 46 do not require IRB review. This tool was developed to assist in the determination of when a project falls outside of the IRB's purview.

Instructions:

Please complete the requested project information, as this document may be used for documentation that IRB review is not required. Select the appropriate answers to each question in the order they appear below. Additional questions may appear based on your answers. If you do not receive a STOP HERE message, the form may be printed as certification that the project is "not research", and does not require IRB review. The IRB will not review your responses as part of the self-certification process.

Name of Project Leader:

Allison Ernst

Project Title:

Implementing Diabetes Screening and Counseling in At Risk Patients

Brief description of Project/Goals:

The purpose of the DNP Project is to implement a consistent diabetes screening and patient education protocol among providers in the clinic. There are currently no specific recommendations for addressing the risk for diabetes and subsequent care among patients who need further treatment. By consistently applying the American Diabetic Association's screening and follow up guidelines, providers will more effectively target the growing concern of diabetes in the population while better serving their patients.

Will the project involve testing an experimental drug, device (including medical software or assays), or biologic?

- Yes
 No

Has the project received funding (e.g. federal, industry) to be conducted as a human subject research study?

- Yes
 No

Is this a multi-site project (e.g. there is a coordinating or lead center, more than one site participating, and/or a study-wide protocol)?

- Yes
 No

Is this a systematic investigation designed with the intent to contribute to generalizable knowledge (e.g. testing a hypothesis; randomization of subjects; comparison of case vs. control; observational research; comparative effectiveness research; or comparable criteria in alternative research paradigms)?

- Yes
 No

Will the results of the project be published, presented or disseminated outside of the institution or program conducting it?


- Yes
 No

Based on your responses, the project appears to constitute QI and/or Program Evaluation and IRB review is not required because, in accordance with federal regulations, your project does not constitute research as defined under 45 CFR 46.102(d). If the project results are disseminated, they should be characterized as QI and/or Program Evaluation findings. Finally, if the project changes in any way that might affect the intent or design, please complete this self-certification again to ensure that IRB review is still not required. Click the button below to view a printable version of this form to save with your files, as it serves as documentation that IRB review is not required for this project. 10/24/2018

Appendix D

American Diabetes Association Diabetes Risk Assessment

Are you at risk for **type 2 diabetes?**



WRITE YOUR SCORE IN THE BOX.

1. How old are you?

Less than 40 years (0 points)
40-49 years (1 point)
50-59 years (2 points)
60 years or older (3 points)

2. Are you a man or a woman?

Man (1 point) Woman (0 points)

3. If you are a woman, have you ever been diagnosed with gestational diabetes?

Yes (1 point) No (0 points)

4. Do you have a mother, father, sister or brother with diabetes?

Yes (1 point) No (0 points)

5. Have you ever been diagnosed with high blood pressure?

Yes (1 point) No (0 points)

6. Are you physically active?

Yes (0 points) No (1 point)

7. What is your weight category?

See chart at right.

Height	Weight (lbs.)		
4' 10"	119-142	143-190	191+
4' 11"	124-147	148-197	198+
5' 0"	128-152	153-203	204+
5' 1"	132-157	158-210	211+
5' 2"	136-163	164-217	218+
5' 3"	141-168	169-224	225+
5' 4"	145-173	174-231	232+
5' 5"	150-179	180-239	240+
5' 6"	155-185	186-246	247+
5' 7"	159-190	191-254	255+
5' 8"	164-196	197-261	262+
5' 9"	169-202	203-269	270+
5' 10"	174-208	209-277	278+
5' 11"	179-214	215-285	286+
6' 0"	184-220	221-293	294+
6' 1"	189-226	227-301	302+
6' 2"	194-232	233-310	311+
6' 3"	200-239	240-318	319+
6' 4"	205-245	246-327	328+

ADD UP YOUR SCORE.

1 point	2 points	3 points
---------	----------	----------

If you weigh less than the amount in the left column: 0 points

If you scored 5 or higher:


You are at increased risk for having type 2 diabetes. However, only your doctor can tell for sure if you do have type 2 diabetes or prediabetes, a condition in which blood glucose levels are higher than normal but not yet high enough to be diagnosed as diabetes. Talk to your doctor to see if additional testing is needed.

Type 2 diabetes is more common in African Americans, Hispanics/Latinos, Native Americans, Asian Americans, and Native Hawaiians and Pacific Islanders.

Higher body weight increases diabetes risk for everyone. Asian Americans are at increased diabetes risk at lower body weight than the rest of the general public (about 15 pounds lower).

The good news is you can manage your risk for type 2 diabetes. Small steps make a big difference in helping you live a longer, healthier life.

For more information, visit us at diabetes.org/alertday or call 1-800-DIABETES (800-342-2383).



American Diabetes Association (2018b). Type 2 diabetes risk test. Retrieved from

<http://www.diabetes.org/are-you-at-risk/diabetes-risk-test/>