# DIABETES-RELATED DISTRESS IDENTIFICATION AND INTERCOLLABORATIVE TREATMENT AT A RURAL, PRIMARY CARE CLINIC

A Dissertation
Submitted to the Graduate Faculty
of the
North Dakota State University
of Agriculture and Applied Science

By

Samantha Jo Fugleberg

In Partial Fulfillment of the Requirements
for the Degree of
DOCTOR OF NURSING PRACTICE

Major Program:
Nursing

October 2021

Fargo, North Dakota

# North Dakota State University
Graduate School

**Title**

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The Supervisory Committee certifies that this ***disquisition*** complies with North Dakota State University's regulations and meets the accepted standards for the degree of

**DOCTOR OF NURSING PRACTICE**

SUPERVISORY COMMITTEE:

Dr. Heidi Saarinen
Chair

Dr. Dean Gross

Dr. Adam Hohman

Dr. Daniel Friesner

Approved:

12/22/2021
Date

Dr. Carla Gross
Department Chair

## ABSTRACT

The ADA found in 2018 that almost half of individuals with diabetes are not meeting diabetes goals, indicating great need for improved care. The purpose of this project was to implement the Diabetes Distress Scale (DDS) in a rural, primary care setting to screen adult patients with Diabetes Type II to improve Type II Diabetes management by identifying and reducing Diabetes-Related Distress (DRD), A1c values, and increasing the utilization of interdisciplinary care already available at the clinic. To reduce time burden on rural healthcare providers, DRD treatment was delegated to preexisting interdisciplinary services, including Diabetes Self-Management Program class, a dietician, and a behavioral health therapist. The project began with education to the clinic staff regarding DRD, American Diabetes Association recommendations regarding DDS use, and underutilized resources and support options currently available at the clinic. During implementation, clinic nurses collected DDS scales and, when positive scales were encountered, a referral algorithm was used to determine beneficial interdisciplinary care visits. Data was collected from June 1, 2019, and ceased on March 1, 2020, due to the 2019 Coronavirus pandemic. During the implementation period, increased referral rates were observed, although many patients declined the services. Of patients with initial A1c values greater than 8%, half of participants reduced A1c below 8% and the other half did not. Results were similar for decreasing DRD with half of participants reporting less at follow-up and the other half reporting the same or more. Two patients reported moderate to high levels of DRD and both experienced substantial increases in A1c values at follow up. The DDS scales facilitated excellent conversations with patients and unveiled components of unmet needs in diabetes care to assist healthcare providers in building an individualized treatment plan that

utilizes interdisciplinary staff members to empower patients with self-care skills to ultimately improve their condition and quality of life.

## ACKNOWLEDGEMENTS

I would like to thank all who aided in the completion of this project. First, to Heidi Saarinen for unwavering positivity and confidence in me throughout the entirety of my doctoral education and the dissertation process. Her expertise, empathy, and patience over the years was greatly appreciated. Also, to my committee members, Dr. Dean Gross, Dr. Adam Hohman and Dr. Daniel Friesner for their proficiency and time in ensuring success of this project. Lastly, to Justin Stromme for choosing to implement this project as common practice within the clinic, it was crucial in data collection and very appreciated.

In addition, I thank my grandma, Sharon and aunt, Char for their incredible amount of support provided throughout my entire life and educational journey. Your love, advise and willingness to always help me is a direct reflection of my accomplishments.

It's important for me to acknowledge our Lord, Jesus Christ, for this opportunity and the completion of this dream to become a nurse practitioner. Thank you for providing me with a passion and tools to care for others. "*Each of you should use whatever gift you have received to serve others, as faithful stewards of God's grace in its various forms*". 1 Peter 4:10. To Him be the glory.

## DEDICATION

This dissertation is dedicated to my family. To my husband, Jeremy and beautiful daughters, Adleigh and Alivia for being so gracious and loving while I completed my education and aspired to a dream. To everyone who cared for and loved my kids during my education journey. And lastly, to my stepdad, Gary, for always believing in me. I have looked to the words you shared with me and your friends many times through this journey for inspiration, “that one is special, she’s going places.” If only I could tell you this now. We love and miss you!

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# CHAPTER ONE. INTRODUCTION

## Background and Significance

Type II diabetes is a difficult disease to manage for patients and healthcare institutions and has a prevalence rate that is alarmingly increasing (Lin et all, 2018). In the United States, approximately 9.4% of the population was diagnosed with diabetes in 2015, accounting for 30.3 million Americans (Center for Disease Control [CDC], 2017). Estimations of the multitude of people diagnosed with diabetes is expected to increase three-fold by year 2060 (Lin et al, 2018). Diabetes is a life-threatening disease that has quickly become the most expensive condition to the healthcare system (American Diabetes Association [ADA], 2018a; Atif et al., 2018; Center for Disease Control [CDC], 2017 Kirkwood, 2018; Ramos et al., 2017). Prevalence rates of diabetes reported by national reporting agencies do not differentiate between types of diabetes in most publications, but it is proven that 90-95% of all diabetes cases are type II (CDC, 2017). Due to the increasing prevalence and large impact of type II diabetes in our region and nation, this practice improvement project (PIP) will focus on how to identify patients with diabetes-related distress (DRD) to improve type II diabetes care and streamline referrals to the appropriate services for increased support.

DRD as a condition is gaining attention because determining a person's distress related to diabetes has a direct correlation with successfully identifying an appropriate treatment plan that results in glycemic control benefit (Gonzalez et al., 2016). The condition DRD is a psychological response to dealing with the difficulties of managing diabetes, which is a demanding, complex, time-consuming, and progressive disease, on a daily basis (Sweatman et al., 2016). Russell et al. (2005) found that in order for patients to follow all recommendations for diabetes care put forth by the American Diabetic Association (ADA), two plus hours of time is required each day.

Although there are not any recent studies reporting time requirements for diabetes management, the ADA has since added more recommendations, suggesting that time required would be even greater.

In 2016, diabetes was attributed as the third leading cause of increased years lived with disability (US Burden of Disease Collaborators, 2018). In addition, a systemic review performed by Atif et al. (2018) affirms that glycemic control is directly correlated with quality of life, asserting that higher blood sugars contribute to increased complications as well as lower financial status and life expectancy. Ramos et al. (2017) also found correlations with glycemic control and modeled approximations of life expectancy. Distress related to diabetes is not a psychological condition but rather an emotional response to a condition that can be overwhelming and threatens current and future quality of life (Atif et al., 2018; Ramos et al., 2017).

Evidence points toward DRD as a contributor for suboptimal diabetes management in the form of poor glycemic control evidenced by hemoglobin A1c (A1c) values (Aikens, 2012; Fisher et al., 2010b; Fisher et al., 2010a; Gonzaelz et al., 2016; Snoek et al., 2015; Zagarins et al., 2012). Poor glycemic control is partially due to the link DRD has been found to have with nonadherence to diabetes treatment plans and medication regimens (Aikens, 2012; Gonzalez et al., 2015; Gonzalez et al., 2016; Pandit et al., 2014; Walker et al., 2014). Glycemic control directly affects complication rates of diabetes, which can be detrimental to patient quality of life due to the disabilities they cause and the complexities they add to the patient's self-care regimen (Atif et al., 2018). Diabetes complications can involve almost any organ of the body but most commonly effects the nerves, kidneys, eyes, peripheral arteries, heart, and brain (Chawla et al., 2016).

Among patients with diabetes, DRD is common. Researchers found that when screened at three different times over an 18-month period, 45.4% of patients reported moderate to high levels of DRD (Fisher et al., 2012). Perrin et al. (2017) found DRD prevalence rates to be 36% at any given time among patients with type II diabetes. Researchers assert that identification is important because DRD can be mistaken for Major Depressive Disorder (MDD) or depressive symptoms in clinical practice and interventions to treat one are not necessarily successful in treating the other (Snoek et al., 2015; Sweatman et al., 2016).

Fortunately, when identified, DRD has been shown to be susceptible to interventions (Baek et al., 2014; Fisher et al., 2013; Sweatman et al., 2016). When provided by a collaborative care team, there is notable patient benefit (Berry et al., 2015; Sweatman et al., 2016; Wagner et al., 2017). Decreasing DRD and, thus, improving glycemic control, can prevent or delay complications listed above (Atif et al., 2018; Sweatman et al., 2016).

## Diabetes Treatment in a Rural Clinic in the Midwestern United States

Currently at a rural, primary care clinic in the midwestern part of the United States, diabetes care does not incorporate screening for DRD. According to Ali et al. (2013), approximately half of individuals living with diabetes in the United States were not meeting glycemic control goals in 2010. This was confirmed recently by the ADA (2018c) who reported that 33-49% of individuals with diabetes still do not meet goals for glycemic control, blood pressure, or blood cholesterol levels, indicating that there is room for improvement in diabetes care. In the most recent publication available, Peterson et al. (2008) found that 80% of patients with diabetes are treated in primary care clinics, making this an excellent place for implementation of a screening process and program for treating DRD.

**Problem Statement**

Although the clinic has the means to provide collaborative care to patients identified as having DRD, currently there is not a standardized system for identification or treatment. Patients are referred to an RN health coach periodically based on estimated time needed for education, usually if patients have multiple questions for the healthcare provider or significant increase in their A1c. The RN health coach then provides education and offers additional services if deemed "necessary" and the patient is willing to attend more appointments for assistance in managing their diabetes care. These additional services available include a dietician, a behavioral health therapist (BHT) available through telehealth during regular clinic hours, and a Diabetes Self-Management (DSMP) class, offered one to three times annually, based upon number of participants available for a class. Referral rates to available disciplines are low, which is attributed to inconsistencies in patient management, patient fear of high costs of additional visits, and patient's belief that additional visits are unnecessary and too time consuming (Tanenbaum et al., 2016; Van Esch et al., 2017).

According to a report generated on August 1, 2018 there were 2,373 patients that claimed a primary care provider at this clinic, 306 of these patients had diagnosed diabetes. In August of 2017, the clinic began offering telehealth visits with a behavioral health therapist (BHT) who is a licensed social worker with a master's degree in counseling. A BHT specializes in helping individuals cope with the complexities of chronic diseases. In 2017, one patient with diabetes was scheduled with the BHT. In 2018, five patients with diabetes were scheduled. Referrals to the BHT were exclusively related to depression and/or anxiety and referrals for any chronic care management was lacking. As of August 1, 2018, the facility had been able to offer Diabetes Self-Management (DSMP) classes, two referrals were made by year-end 2018. In 2016, 13 patients

with diabetes were seen by the diabetic educator and dietician and 11 were seen in 2017. Recently, the clinic lost their diabetic educator due to low referral rates and the administration opted not to employ another at the facility.

**Detecting and Treating DRD**

Implementing both a screening process for identifying DRD and a standardized referral system to necessary disciplines for improvement would be beneficial in this facility. The Brief Diabetes Distress Scale (DDS-2) and the Diabetes Distress Scale (DDS-17) is an excellent way to detect DRD (Fisher et al., 2008; Fisher et al., 2012; Gonzalez et al., 2016; Polonsky et al., 2005). The DDS-2 is a two-item questionnaire that is 97% accurate in detecting DRD and can be administered and completed by all patients with type II diabetes within seconds, or in some cases, up to one to two minutes (Fisher et al., 2008). If the patient screens positively on the DDS-2, they then should be administered the full 17-item scale, the DDS-17, which identifies four subcategories that help detect the root cause of DRD. These subcategories include emotional burden, physician-related distress, regimen-related distress, and interpersonal distress (Polonsky et al., 2005). Once a contributing subcategory can be identified, interventions specific to the concerning area can be implemented in order to improve DRD and positively impact hemoglobin A1c levels. Treatment of DRD has the potential to improve glycemic control and quality of life for patients with type II diabetes (Atif et al., 2018; Gonzalez et al., 2015; Pandit et al., 2014; Snoek et al., 2015; Walker et al., 2014).

Interventions that can directly target sources of DRD are best implemented by healthcare disciplines specifically trained in that care. If DRD is being experienced in the form of emotional distress or interpersonal distress, visiting with a BHT (Mann et al., 2016; Wagner et al., 2017) and attending the DSMP class (Lorig et al., 2009; Lorig et al., 2016a; Odgers-Jewell et al., 2017)

can reduce these forms of DRD. If DRD is being experienced in the form of physician-related distress, the RN health coach can provide education and assist the patient in finding a new healthcare provider if necessary (Schoenthaler et al., 2012; Wagner et al., 2017). This population would also benefit from a visit with the BHT, who can assess if the patient's expectations are realistic. Lastly, the DSMP class could be beneficial to learn new communication skills, especially those taught regarding interaction with the healthcare team (Lorig et al., 2009). Lastly, if DRD is being experienced in the form of regimen-related distress, a visit with the dietician (American Diabetes Association [ADA], 2018b) and attending the DSMP class (Lorig et al., 2009) would be most beneficial.

Addressing DRD in a rural primary care clinic has great potential to improve diabetes outcomes (Sweatman et al., 2016). Because rural primary care clinics often have limited resources to address diabetes management, implementing a way to direct the flow of patient care can be especially successful. By utilizing a self-report measure like the DDS, the clinic can save time and improve care for patients with type II diabetes while also optimizing services already available.

This program aided in the attainment of the Healthy People 2020 objectives managed by the U. S. Department of Health and Human Services. The program supports the accomplishment of objective D-14: to increase the number of patients with diabetes who report receiving formal education about their condition (Center for Disease Control and Prevention [CDC], 2011b). Meeting diabetes goals in the Healthy People 2010 initiative was unsuccessful, therefore further calling attention to the need for changes in our current practices of diabetes management in primary care clinics (Ali et al., 2013; ADA, 2018c).

## Purpose of the Project

The purpose of this project was to implement the Diabetes Distress Scale to identify patients with type II diabetes who are at high risk for poor glycemic control. Then, the identification of DRD as well as its subcategory was guided by appropriate referrals and interventions among the available resources at the rural, primary care clinic. The project provided information that allowed the healthcare team to provide individualized, patient-centered care to decrease diabetes-related distress and ultimately improve patient outcomes through improved A1c values.

## Project Objectives

The project was guided by the following objectives:

1. Adult patients with type II diabetes who screen positively for diabetes-related distress will have increased referral rates for support services within the primary care clinic, specifically, Diabetes Self-Management Program class, counseling by a behavioral health therapist, and/or dietician by July 1, 2020 (due to novel Coronavirus, data collection ceased March 1, 2020).
2. Patients who adhere to the referral process and attend recommended appointments will have decreased diabetes-related distress scores.
3. The number of patients empaneled at this clinic with a hemoglobin A1c value that is greater than 8.0% will decrease by July 1, 2020 (due to novel Coronavirus, data collection ceased March 1, 2020).

# CHAPTER TWO. LITERATURE REVIEW

## Introduction

A literature review was performed to understand and summarize existing psychological barriers patients experience that may prevent successful treatment of diabetes and find new and innovative ways to offer holistic care to these individuals. Of particular interest became the concept of diabetes-related distress (DRD) because it is a well-studied concept that is linked to diabetes outcomes (Gonzalez et al., 2015; Pandit et al., 2014; Snoek et al., 2015; Walker et al., 2014). Diabetes related distress is a psychological response to having to deal with the daily difficulties of managing diabetes, a demanding, complex, time-consuming, and progressive disease (Sweatman et al., 2016). It is an emotional response to having diabetes, which threatens current and future quality of life (Atif et al., 2018; Ramos et al., 2017).

A search was conducted using a variety of electronic databases including Academic Search Premier, PubMed, Science Direct, and the Cochrane Library. Key words used in the search included, "Type II diabetes, diabetes-related distress and United States". Articles from the reference lists of sources found were also included if relevant. Exclusions included studies of type I diabetes, gestational diabetes, and child or adolescent studies. International and culture specific studies were excluded. Healthcare is diverse in different countries including provider to patient ratios, access to care, and health coverage, not to mention the different values and beliefs that could really influence the experience and reporting behaviors in individuals with DRD. This theory is supported by a study performed by Ikeda et. al (2014) that compared reported DRD levels from Americans in comparison to Japanese individuals living in Japan. The results revealed significantly different reported levels of DRD. This was attributed to differing culture values, for instance, Western cultures value independence and autonomy, whereas Eastern

cultures value interdependence and connection with others (Kitayama et al., 2006). Further supporting this rationale was the DAWN2 trial that concluded significant reporting differences of DRD across seventeen countries (Holt et al., 2016).

**Diabetes Intranational Prevalence**

In the United States, approximately 9.4% of the population was diagnosed with diabetes in 2015, accounting for 30.3 million Americans (CDC, 2017). Lin et al. (2018) report the estimated number of people with diabetes in the U.S. is expected to increase to 39.7 million or 13.9% of the population in 2030, and to 60.6 million or 17.9% of the population in 2060. This claims that the multitude of people diagnosed with diabetes will increase three-fold, and percent prevalence will double by year 2060 (Lin et all, 2018).

**Diabetes Mortality**

The Centers for Disease Control and Prevention (CDC) (2017) reported that diabetes was the 7$^{th}$ leading cause of death in 2015. However, Stokes and Preston (2017) used the COX model, a statistical procedure that analyzes the relationship between the survival of a patient and their physical and lifestyle characteristics, to adjust for age, sex, race/ethnicity, education level and smoking context, and found that the number of deaths attributed to diabetes is grossly understated. Using a population attributable fraction, which considers the ubiquity of deaths that occur in diabetic individuals and percentage of deaths that would not have occurred in the absence of diabetes, they estimated diabetes to account for approximately 12% of deaths (Stokes & Preston, 2017). This is a much larger percentage than the 3.3-3.7% reported by the CDC (2017). Stokes and Preston (2017) attribute this to the low sensitivity and specificity used when completing death certificates. They assert that the cause of death listed on death certificates is not an accurate marker of actual mortality profiles and that multiple patients die of conditions that

were directly caused by their diabetes, although diabetes is not considered when writing out death certificates (Stokes & Preston, 2017). Diabetes mortality accounts for 12% of deaths in the United States, the third leading cause of death, behind only cardiovascular disease and malignant neoplasms and ahead of lower respiratory and cerebrovascular diseases (Heron, 2018).

**Cost of Diabetes**

Diabetes also claims a significant portion of healthcare dollars every year. In fact, diabetes is the most expensive condition in the United States (Kirkwood, 2018). According to the report, Economic Costs of Diabetes in the U.S. issued by the CDC in 2017, individuals diagnosed with diabetes in the United States allocated an approximate expenditure of $327 billion dollars of direct and indirect medical costs in 2017, which implies that those with diabetes have 2.3 times, an additional $9,601 per year, higher healthcare costs than they would if they did not have diabetes (ADA, 2018a). The ADA researchers figure one out of every four healthcare dollars is spent indirectly treating diabetes and one out of every seven dollars is spent directly treating the disease. In 2017, individuals that had a diabetes diagnosis accounted for 24.8% of all hospital inpatient stays, 50% of all emergency department and office visits, 25% of nursing home beds, and they consumed 50% of all prescriptions given (ADA, 2018a).

With healthcare costs rising every year, it is not surprising that the cost of diabetes is also increasing, but the extent is overwhelming. The ADA (2018a) compared 2017 costs with those from 2012 and after adjusting for inflation, they report the cost of diabetes had increased by 13% per person within those five years. When they accounted for the 11% increase in national prevalence of those diagnosed with diabetes and adjusted for inflation, healthcare spending increased by 25-26% for diabetes care from 2012 to 2017 (ADA, 2018a). Because of imploding costs of diabetes, in March of 2018 the ADA held their annual Call to Congress event, which

involved 179 different meetings with congressional members and staff, urging them to declare diabetes a national priority (Kirkwood, 2018).

## A Call for Change in Current Diabetes Treatment

The Healthy People 2010 and 2020 initiatives have acted as a model to direct healthcare agencies and the public to goals for a healthier world. Healthy People 2010 objectives related to diabetes were directed toward decreasing prevalence, mortality, costs, and conditions that decrease quality of life for individuals (CDC, 2011a). A report released by Ali et al. (2013) analyzed the achievement of the Healthy People 2010 goals with unfortunate findings. Despite initiatives and changes in healthcare institutions to provide better care for patients with diabetes, only 14.3% of the diabetes population met the four focus measures to decrease diabetes burden and increase quality of life, including glycated hemoglobin level (A1c), blood pressure, LDL cholesterol, and smoking (Ali et al., 2013). Approximately half of individuals with diabetes were not meeting their glycemic control goals (Ali et al., 2013). Recent confirmation was made by the ADA (2018c), which reported in 2018 that 33-49% of patients were still not meeting goals related to glycemic control, blood pressure, cholesterol, and smoking.

Healthy People 2020 goals for diabetes are similar to those of 2010 (CDC, 2011b), further suggesting the need for improvement to reach unmet objectives from 2010 by the 2020 remeasure. This information sends a valuable message for the need for new insight, treatment plans, and standards of care to better manage this large population of people. The exploration of DRD offers excellent new insight into diabetes care. DRD can offer new options for treatment plans and has the ability to improve the standards of care for many. Upwards of 80% of diabetes is managed in primary care clinics, making this environment an important place to implement a project to screen and treat DRD (Peterson et al., 2008).

Many attempts are being made to decrease the burden of diabetes on society and on individuals. Screening for DRD to decrease diabetes burden is important, as DRD is common, under-detected, and affects patient success with treatment regimens and, thus, outcomes in the form of A1c values (Gonzalez et al., 2015; Pandit et al., 2014; Snoek et al., 2015; Walker et al., 2015). The Distress and Depression in Diabetes Study (3D study), a nonintervention examination, looked at patients in three different time waves and reported that 45.4% of patients experience moderate or high levels of DRD over an 18-month period (Fisher et al., 2012). Recently, a meta-analysis of 55 studies by Perrin et al. (2017) found DRD prevalence rates to be 36% at any given time among patients with type II diabetes. This is 6% higher than the average distress rate related to any chronic disease (Snoek et al., 2015).

Distress related to diabetes is associated with glycemic control and, thus, patient outcomes and quality of life (Atif et al., 2018; Gonzalez et al., 2015; Ramos et al., 2017; Snoek et al., 2015). Glycemic control is directly correlated with diabetes-related complications, which can be both neurological and/or vascular in nature (Atif et al., 2018; Chawla et al., 2016). Common neurological complications include cognitive decline and multiple forms of neuropathy, a physical source of pain for many. Vascular complications can include kidney disease, retinal disease, peripheral artery disease, cerebrovascular accidents, and heart disease, which is the number one complication of diabetes and the number one cause of mortality in the United States (Heron, 2018).

## Diabetes-Related Distress vs. Depression

### Diabetes-Related Distress, Major Depressive Disorder, or Depressive Symptoms?

Multiple researchers have attempted to clarify the difference between DRD, MDD, and depressive symptoms because the three can be mistaken for each other in practice (Fisher et al.,

2007; Sweatman et al., 2016). Depressive symptoms, MDD, and DRD can have similar symptoms, but DRD needs to be differentiated from other conditions because it requires different interventions to be treated successfully (Snoek et al., 2015; Sweatman et al., 2016). DRD is distinct from major depressive disorder (MDD) in that DRD is an emotional response to a condition that is demanding, as opposed to a collection of symptoms that have occurred for two weeks or more, without investigation of cause, that is correlated with chemical imbalances of the brain (Berry et al., 2015; Snoek et al., 2015).

For a positive diagnosis of MDD, a patient must display five out of nine symptoms almost every day, these include, depressed mood or irritability, decreased interest or pleasure in most activities, 5% weight change or change in appetite, increased or decreased sleep, change in activity level, fatigue, guilt or worthlessness, difficulty concentrating, or suicidal ideation (Center for Substance Abuse Treatment, 2008; Uher et al., 2014). Depressive symptoms are a diagnosis given to someone who reports feelings of depression and/or screens positively on a self-report depression questionnaire but does not meet the DSM criteria for a diagnosis of MDD (Fisher et al., 2010b).

Imperfections in the literature are apparent when assessing MDD and depressive symptoms with diabetes and is a cause for confusion (Fisher et al., 2014). These imperfections consist of vague definitions of depression, as well as the inconsistency in methods used to identify or diagnose MDD and depressive symptoms among the studies (Snoek et al., 2015). Although structured interviews facilitated by a trained mental health specialist is the gold standard, this is costly and unavailable in many rural areas. Self-report screening tools for depression are heavily relied upon in practice but clinical trials need to be conducted that attempt

to prove what the screening tool is actually detecting (Fisher et al., 2007; Fisher et al., 2014; Snoek et al., 2015).

**Self-Report Depression Screening Tools**

Accusations have been made that self-report depression screenings have a high false-positive rate for diagnosable MDD. The Action to Control Cardiovascular Risk in Diabetes (ACCORD) trial revealed that greater than 50% of positive PHQ-9 depression screens failed to have symptoms plausible for a diagnosis of MDD when a Composite International Diagnostic Interview was conducted (Anderson et al., 2011). A study performed by Roy et al. (2012) further supported this finding and reported a 44-77% false positive rate among patients who screened positively for MDD on the Beck Depression Inventory and CES-D.

The above information does not dispute the use of self-report depression screenings in clinical practice; they save valuable time and facilitate important conversations between patients and their healthcare team. What this information does is bring about the question, why are the false positive rates so high? If it's not depression, what are the self-report depression questionnaires capturing (Fisher et al., 2007; Fisher et al., 2014; Gonzalez et al., 2016)?

Fisher et al. (2007) suggest that self-report depression questionnaires may be capturing situational, depressive symptoms and, in patients with diabetes, DRD. The 3D study, noted in the above section, found that 70% of patients that screened positively on the CES-D self-report depression screen did not meet diagnosis criteria for MDD, mostly because their symptoms were situational and related to specific life circumstances, like living with diabetes (Fisher et al., 2007). Fisher and colleagues (2010b) went further in their attempt to understand the differences among DRD, MDD, and depressive symptoms and imply that patients with diabetes may only experience DRD and/or MDD. The two can occur together or separately. After analyzing the 3D

study, they argued that patients with diabetes assumed to have depressive symptoms may in fact be experiencing DRD (Fisher et al., 2010b). This information demonstrates that patients with diabetes that screen highly on depression self-report measures could be experiencing DRD, regardless if they meet diagnosis criteria for MDD. This is clinically meaningful as it points out the strong possibility that there are unidentified needs in patients with diabetes in the form of DRD that serve as new targets for intervention. The evidence highlights the importance of screening for both MDD and DRD separately in practice and treating both applicably as different conditions.

**Relationships with Glycemic Control**

Depression is well known for its devastating effects on patient quality of life and often looked at as the source of noncompliance in patients with diabetes. Compelling new evidence about DRD has come to light that does not contradict the importance of treating depression in diabetes, but adds a new perspective that has promise to improve care, especially glycemic control as measured by A1c values, something the treatment of depression has failed to do in multiple studies (Aikens, 2012; Fisher et al., 2010a; Fisher et al., 2010b; Gonzalez et al., 2016; Snoek et al., 2015; Zagarins et al., 2012).

Zagarins et al. (2012) performed a study comparing glycemic control in the form of A1c with depressive symptoms and DRD in 234 patients with type II diabetes. They found through multiple linear regression that a change in depressive symptoms was not correlated with any changes in A1c values. On the other hand, a 10-point decrease of DRD, the average change within the study, was associated with a 0.25% average decrease in A1c value at 6- and 12-months post intervention. Further supporting this theory with a different study type, Aikens (2012) used cross-sectional and longitudinal analyses to measure the differences of depressive

symptoms and DRD as longitudinal predictors of A1c and medication adherence. Aikens (2012) found that DRD, but not depressive symptoms, forecasted future A1c values and medication adherence. Fisher et al. (2010a) found these same results when they sought to specifically use the Patient Health Questionaire-8 (PHQ-8), the most common self-report depression screening tool minus one question, to test for associations with DRD. They administered 463 patients with type II diabetes the PHQ-8 as a binary or continuous variable and found no change association with A1c, further simplifying the association between A1c and DRD with no association of A1c with MDD or depressive symptoms (Fisher et al., 2010a).

Snoek et al. (2015) go further to suggest a reciprocal relationship between DRD and glycemic control and argue that if the two are not currently correlated, they most likely will be in the near future. Fisher et al. (2010b) concur and add that DRD and A1c have a bidirectional relationship. By using multilevel modeling to analyze cross-sectional relationships between MDD via Composite International Diagnostic Interview, depressive symptoms via the Center for Epidemiological Studies-Depression (CES-D) and DRD via the Diabetes Distress Scale (DDS-17), they found only DRD to be associated with changes in A1c values, both MDD and depressive symptoms were not (Fisher et al., 2010b).

This evidence supports that depression and DRD are correlated and bidirectional, but they are not interchangeable, and both require different interventions for treatment (Fisher et al., 2010; Snoek et al., 2015). It is generally accepted that MDD is treated best with a combination of pharmacological means and psychological therapy (Sweatman et al., 2016). DRD on the other hand calls for interventions that are aimed at the specific causes of DRD that seeks to reduce it. DRD does not require specialized care and can be successfully treated in primary care practices that utilize a collaborative care approach (Berry et al., 2015; Sweatman et al., 2016).

## Measuring Diabetes-Related Distress

Currently, DRD is detected and diagnosed by self-report screening tools. Diabetes-related distress was first measured by the Problem Areas in Diabetes (PAID) scale that was developed in 1995 by Polonsky et al. (1995). Ten years later, many of the same researchers set out to improve the scale. They enlisted the expertise of diabetes educators, dieticians, diabetologists, psychologists with diabetes training and considered patient perspectives in the development of the DDS-17 (Polonsky et al., 2005). The reliability, internal consistency, and validity have been proven adequate (Polonsky et al., 2005; Schmitt et al., 2016; Snoek et al., 2015).

### Diabetes Distress Scale-17 (DDS-17)

The DDS-17 is a 17-item questionnaire that identifies DRD and addresses four different areas of common sources. The four subcategories include emotional burden, physician-related distress, regimen-related distress, and interpersonal distress (Polonsky et al., 2005). Each question is answered on a Likert scale from one to six, one indicating not a problem to six, a very serious problem. After an individual completes the questionnaire, the score is calculated and averaged amongst the four subcategories, indicating where diabetes distress is coming from. See Appendix D for a visual of the scale as well as directions for averaging the subcategories and total item score. By understanding the type and severity of DRD, healthcare providers can have a better understanding of the client's needs and employ more appropriate interventions (Sweatman et al., 2016).

Cut-points were established by researchers of the DDS-17 by studying curvilinear relationships between the DDS17 and glycemic control, diabetes specific self-efficacy, diet and physical activity in two large community samples of individuals with type II diabetes (Fisher et al., 2012). These researchers define DRD scores as follows: DDS17<2.0 is categorized as little to

no distress, DDS17 = 2.0-2.9 as moderate DRD, and DDS17>3.0 as high DRD. Moderate to high DRD is correlated with A1c values in multiple cross-sectional, longitudinal, and regression analysis studies, as well as in the first published study to use structured equation modeling to associate the relationship (Aikens, 2012; Asuzu et al., 2017; Fisher et al., 2010a; Fisher et al., 2010b; Gonzalez et al., 2015; Pandit et al., 2014; Walker et al., 2014; Wardian & Sun, 2014; Winchester et al., 2016; Zagarins et al., 2012; Zulman et al., 2012). This indicates that the DRD people experience directly affects their diabetes management at an average score of 2.0 on the DDS17. Researchers have found from some of the studies that a relationship between DRD and A1c, as well as others, also show a direct effect of DRD on compliance with treatment plans and medication adherence, further supporting the effect of DRD on glycemic control and ultimately, diabetes outcomes (Aikens, 2012; Gonzalez et al., 2015; Pandit et al., 2014; Schoenthaler et al., 2012; Walker et al., 2014).

**Diabetes-Distress Scale-2 (DDS-2)**

Fisher et al. (2008) developed a brief instrument from the DDS-17 to identify DRD quickly and accurately in clinical settings. The DDS-2 also uses a Likert scale from one to six, the same way the DDS-17 previously described does. The cut-point study for DDS-17 described in the previous section also reviewed the DDS-2 in the same manner. Researchers found that the curvilinear relationship described above was the same between the DDS-17 and DDS-2, concluding that the DDS-2 also demonstrated a positive screening at an average score of 2.0 (Fisher et al., 2012).

The DDS-2 is 97% accurate in identifying positive diabetes distress among individuals with type II diabetes and is recommended for use in care with patients with type II diabetes (Fisher et al., 2008; Beverly et al., 2017). It is an extremely useful tool in a high-paced primary

care clinic because patients can fill it out quickly, thus making accuracy and swiftness of the DDS-2 a favorable instrument to give to all patients with type II diabetes to screen for DRD. If a patient has a positive screen on the DDS-2, they should then be given the full-scale DDS-17 scale to identify where the source of DRD is coming from (Fisher et al., 2008; Sweatman et al., 2016). See Appendix C for the DDS-2 form.

The false positive screen rate for the DDS-2 was found to be 3.3% when researchers administered the full DDS-17 to all participants (Fisher et al., 2008). This false positive rate makes the DDS-2 a reasonable screening tool in primary care not only due to being acceptable for clinical practice, but also, the effect from a false positive result would be filling out the DDS-17, which is estimated to a take few minutes to complete and has no detrimental effects on the patient (Fisher et al., 2008).

## Importance of Collaborative Care

Collaborative care is important for individuals with diabetes, especially those experiencing moderate to high levels of DRD, to promote better glycemic control (Sweatman et al., 2016). Specialized care is not a necessity for treating DRD and unmet needs of these patients can be successfully treated within the primary care setting that uses a collaborative care model that focuses on the holistic care of the person (Berry et al., 2015). By utilizing healthcare personnel to their full potential and scope, patients are allowed more time to talk about their conditions and they feel more supported by their healthcare team (Wagner et al., 2017). Patients are allowed the time to give their perceptions of their DRD to each discipline in their separate visits, which is a crucial aspect, as each discipline attempts to understand and treat aspects of DRD that they specialize in. An understanding by each discipline of the patients' perception of their DRD will facilitate the use of appropriate interventions (Erickson et al., 1983/2009). In

addition, patients are given more individualized information as well as more specific self-management tasks when they see multiple healthcare professions as opposed to being seen by their healthcare provider alone (Wagner et al., 2017).

Lastly, when patient education is the shared responsibility of other fully capable members of the healthcare team, the healthcare provider has more time to focus on the tasks and concepts that only they are qualified for (Wagner et al., 2017). Delegation by the provider to the care team offers an extension of care to the patient that can improve outcomes, such as A1c values (Tricco et al., 2012; Wagner et al., 2017). Registered Nurse (RN) health coaches, dieticians, behavioral health therapists, and diabetes self-management program classes are all qualified to offer education and support that may reduce DRD.

**Registered Nurse Health Coach**

The efficiency of the healthcare provider's practice can be significantly improved with a collaborative treatment approach with the RN health coach (Wagner et al., 2017). The Robert Wood foundation sponsored a program called Primary Care Team: Learning from Effective Ambulatory Practices (PCT-LEAP) and nominated 227 primary care clinics that were considered innovative and performing best in their class (Wagner et al., 2017). Of the 227, 30 were chosen for thorough examination with a goal to report on their successes and give other healthcare organizations information on how they can improve their practices. They found that the LEAP organizations were utilizing RNs to the fullest extent of their licensure. They reported RNs as designated care managers who met with patients with more complicated chronic diseases independently, outside of visits with their healthcare provider, to offer support and education (Wagner et al., 2017). In addition, researchers of a meta-analysis that included forty-eight clinical trials implied that involvement of nurses and other healthcare professions in a patient's

treatment plan point to improvements in diabetes care as well as increased patient and healthcare personnel job satisfaction (Tricco et al., 2012; Wagner et al., 2017).

Time, a valuable resource, can be saved when the nurse carries out functions within their scope of practice that is delegated by the healthcare provider (Wagner et al., 2017). Specifically, administration of self-report scales such as the DDS-17, referrals, and offering education utilizing motivational interviewing tactics are tasks that can performed by the nurse and can improve provider productivity (Wagner et al., 2017). Placing referrals from an evidenced-based referral system and motivational interviewing can improve the patients' perception of care as well as their outcomes (Ostlund et al., 2016; Sweatman et al., 2016; Wagner et al., 2017).

Researchers participating in the REDEEM trial found that reductions in DRD are sustainable over time but follow up care in the primary care clinic will be important because recurrence is possible (Fisher et al., 2012; Fisher et al., 2013). The RN health coach can identify recurrence of DRD with the DDS-17 and provide follow up care by coordinating with providers to ensure individualized, patient-centered care is achieved. This coordination will ensure that treatment plans remain appropriate and diabetes care continues to be optimized throughout the patient's lifespan. Follow up care involved included the assessment of attainment of goals and ensuring the healthcare institution is doing what's possible to equip the patient with the necessary tools to meet those goals. An RN health coach can offer the patient resources to decrease all forms of diabetes-related distress in the form of referrals to appropriate disciplines, making them an excellent candidate to administer screenings, follow through with an appropriate treatment plan and provide appropriate follow up care (Wagner et al., 2017).

The RN health coach can specifically assist patients if they are experiencing DRD in the form of physician-related distress. RN health coaches are trained to educate patients on rationale

behind the decisions of healthcare providers (Schoenthaler et al., 2012; Wagner et al., 2017). If deemed necessary, the RN health coach can also help the patient find a healthcare provider that is more suited to their needs (Schoenthaler et al., 2012; Wagner et al., 2017).

**Dietician**

Dieticians play a key role in the management of patients with diabetes. They can provide individualized, customizable diet plans that are realistic for the patient. They can also access barriers to any diet plans and provide alternative recommendations. The American Diabetes Association has established a grade A recommendation that patients with diabetes meet with a registered dietician to optimize their diabetes care (ADA, 2018b). Franz et al. (2017) report that medical nutrition therapy is associated with 1.0-1.9% decrease in hemoglobin A1c values.

Because A1c and DRD has a bidirectional relationship it is feasible to state that DRD would also be reduced from education time with a dietician (Snoek et al., 2015). A major area of concern for people with type II diabetes who want to control their blood sugars is difficulty with meal planning and carbohydrate counting. Dieticians can directly and confidently teach patients about the importance of food choices in diabetes care and reduce DRD subcategory regimen-related distress.

**Social Worker as Behavioral Health Therapist**

Sixty-three percent of the practices that were studied in the previously cited LEAP program utilized behavioral health therapists (BHT) in the primary care clinic, most of these roles filled by social workers that were licensed therapists (Wagner et al., 2017). Behavioral health therapists are trained to assist individuals in coping with their diagnosis and identifying underlying causes of poor control of chronic conditions, for instance, poor glycemic control in diabetes patients. Schmidt et al. (2018) performed an extensive literature review of clinical trials

and found that psychological interventions that were diabetes specific lowered both DRD and A1c values. Further validating this intervention, Berry et al. (2015) found that psychological interventions mixed with traditional diabetes education are useful to reduce DRD and improve glycemic control.

**Diabetes Self-Management Class**

Diabetes self-management program (DSMP) classes are currently being offered all over the world and in the United States. All information regarding the program can be found at SMRC professional website: https://www.selfmanagementresource.com. The DSMP class was developed at Stanford University by a Ph.D. candidate with the support and instruction of diabetes specialists such as diabetes educators and endocrinologists. The course is six-weeks and participants meet weekly for 2.5-hour sessions that are led by two individuals trained specifically on how to instruct the highly scripted material. The Self-Management Resource Center (SMRC) website has detailed information regarding the program, including a description of the main teaching points of the class, which includes diet planning and healthy eating, medication use, effective communication with healthcare providers, appropriate exercise routines, and techniques to face diabetes symptoms such as fatigue, pain, high and low blood sugars, stress, depression, and emotions such as anger and/or frustration. Studies have shown its benefit in reducing healthcare costs, improving self-management practices such as increased physical activity or better food choices, and lowering A1c values at six and twelve months (Lorig et al., 2016a; Lorig et al., 2016b; Lorig et al., 2009; Turner et al., 2018). This curriculum can directly influence DRD and should be used for all individuals who screen positively, regardless of the subcategory identified as the cause.

## Current Gaps in Literature

Limitations were identified throughout the studies that were referenced in this literature review. Most of the studies were cross-sectional and/or longitudinal in nature. The number of clinical trials was low, especially those that were conducted in the United States. The one clinical trial that was relevant to this literature review did offer differing results than multiple other cited sources. Fisher et al. (2013) found through the REDEEM trial that although DRD is common in individuals with diabetes and can be lowered through support-type interventions, this clinical trial did not reveal any significant changes in hemoglobin A1c values when compared to associated changes in DRD. This finding can be attributed to the low average A1c value of 7.4% of this study. Interventions to improve A1c values are most impactful and statistically significant when A1c values are above 9% (Chrvala et al., 2016). In addition, all three of the interventions employed in the trial were computer based, possibly indicating that computerized interventions alone do not provide adequate information for lifestyle changes that would decrease hemoglobin A1c values. This seems more plausible than the theory that hemoglobin A1c values are not correlated with DRD severity.

The existing literature also lacks information regarding the best way to screen for DRD. The literature review did not provide perspective regarding when to administer DDS-2 and DDS-17 scales during clinic visits. In addition, no information was available as to whether the time between administration of DDS-2 and DDS-17 is of relevance. Although the literature does confirm the validity, reliability and internal consistency of the DDS-17, many researchers are urging others to complete clinical trial type studies to understand which screening tool is best at identifying DRD. Schmitt et al. (2016) found that the PAID scale, another validated and common tool, was more associated with quality of life and dysfunctional coping mechanisms, while the

DDS-17 was strongly correlated with outcomes such as clinical diabetes indicators and self-care ability. From the literature review, the DDS-17 was chosen as the screening tool for this PIP due to validity, reliability, and focus on identifying DRD.

The gold standard method for diagnosing depression is a structured interview performed by a mental health professional but is not a plausible option for many rural primary care clinics due to associated high costs and unavailability of trained mental health specialists (Fisher et al., 2014; Weinhold & Gurtner, 2014). Rural clinics must rely on self-report screening tools to detect depression, but evidence does not exist that compare all screening tools against one another and cannot make a recommendation for which is best. All studies found in this review linked A1c more closely to DRD than to MDD or depressive symptoms, except one from Gonzalez, Delahanty, Safren, Meigs, & Grant (2008), who evaluated 848 primary care patients and concluded that specific depressive symptoms are more closely related to positive diabetes outcomes than DRD. This was also the only study that used Harvard Department of Psychiatry/National Depression Screening Day Scale (HANDS) as the self-report screening tool to detect and diagnose depression. It is difficult to compare studies against one another when depression detection, diagnosis, and screening tools differ amongst the studies. With disputing information, it is important that researchers standardize screening processes and precisely report their methods in their identification of MDD, depressive symptoms, and DRD so that clarity can be achieved.

The most relevant information that was missing from the literature was the number of studies performed within practice settings that assessed interventions to treat DRD. This project added to the literature by employing a program within practice to detect and treat DRD. For 13 months, DRD and A1c values were followed and provided information on specific disciplines'

ability within a primary care setting to successfully treat DRD. The program identified DRD and the overall assessed outcome with the ability of a standardized referral system to reduce A1c and DRD. The optimization of glycemic control can increase patient quality of life by simplifying care for the patient and preventing or delaying complications of diabetes.

## Conceptual Framework: Logic Model

To draft the concepts of this PIP, a Logic Model (Appendix F) was as created. The logic model was created utilizing a template from the CDC Division for Heart Disease and Stroke Prevention (2017) that is available for public use. This logic model is a tool to guide the planning, integration, and evaluation of the project within the primary care clinic.

Concepts included in this logic model are resources/inputs, activities, outputs, outcomes, impacts and contextual factors. Resources/inputs are what is needed for implementation and was considered in the planning phases to facilitate the activities, which are the events planned to make the program successful. The activities of the project produced the outputs and ultimately, the outcomes, which are the desired, end results of the project. The outputs were examined to figure the impact the PIP would have on provider practice in this rural, primary care clinic. During the evaluation of the project, additional inputs/resources may be identified, leading back to the beginning, resources/inputs, if needed. Contextual factors are external components that can influence the outcome of the project. Contextual factors were explored in relation to the environment that the PIP will be employed in and two factors arose, including patient willingness to follow recommended guidelines and meet with indicated members of the interdisciplinary team, as well as patient ability to pay for the additional visits. Evidence suggests that intentional education, scripting, and addressing financial barriers directly can help alleviate

these factors (McBrien et al., 2017). The RN health coach comprises these skills (Wagner et al., 2017).

When the patient is educated on available resources using this referral system, the educator will be able to focus on what each discipline can specifically offer to reduce the patient's DRD. The education can be geared toward the patient's needs and may decrease patient belief that additional visits are unnecessary (McBrien et al., 2017). With evidence supporting the treatment of DRD, the educator will be able to explain to the patient their healthcare providers support in their continuing education with other disciplines within the clinic (Wagner et al., 2017). For instance, "Because we found today that you are experiencing DRD in the form of emotional burden, your healthcare provider thinks it's necessary you have a visit with the BHT and attend the DSMP class to get the support you need to manage diabetes, can I set up those appointments for you?" as opposed to "Would you like to see the BHT or attend the DSMP class?" When patients see the necessity of further treatment to improve their diabetes care, they may not be as concerned about the cost of additional visits (McBrien et al., 2017; Van Esch, 2017). If cost remains a concern, focusing on the disciplines that can help the patient decrease their specific form of DRD will be necessary to reduce healthcare spending (Berry et al., 2015). Patients can also be provided with a cost estimate of the visits that are most important in their care. Fortunately for patients, the DSMP class recommended for anyone with DRD is free and available to any patient over the age of 18.

## Theoretical Framework: Modeling and Role Modeling

Helen Erickson, together with Mary Ann Swain and Evelyn Tomlin, developed the theory known as Modeling and Role Modeling (MRM). The term modeling and role modeling was first used by Milton Erickson, Helen Erickson's father-in-law, who taught her that patient perspective

is important because people know themselves better than their healthcare providers do (Smith & Parker, 2015). Erickson's theory was developed over the years in her educational experiences, coupled with her work environments and as she discovered her "Self" (Smith & Parker, 2015). The theory can be applied to any population and to any circumstances that involve providing patient care (Erickson et al, 1983/2009). It can be argued that definitions and applications of nursing in this theory should be globally applied to any healthcare professional providing patient care.

This theory is suited for this PIP because it emphasizes patient worth, importance of empathy from healthcare providers and gives them a new prospective to patient behaviors, especially those in the sometimes frustrating, "difficult to treat" category, such as patients with DRD who do not have optimal glycemic control. In the most recent and available publication, Russell et al. (2005), identified that in order for patients to follow a treatment regimen that incorporates all the guidelines set by the American Diabetes Association, it requires two plus hours each day, much of this time spent on exercise and diet recommendations, two very important aspects to management of type II diabetes. Understanding the perspective from the patient's world is important for healthcare providers to be able empathize with patients trying to manage a daunting, time-consuming and frustrating condition, such as diabetes (Erickson et al., 1983/2009).

**Nursing Philosophical Assumption**

Key philosophical assumptions to MRM theory involve *nursing* and the *patient*. Nursing involves a welcoming nature and genuine acceptance of the person that facilitates holistic care (Smith and Parker, 2015). Erickson further explains, "Unconditional acceptance of a person as a worthwhile being is not the same as accepting all behaviors without conditions…we recognize

that behaviors are motivated by unmet needs". (Smith & Parker, 2015, p. 191). This is especially true for those who have a difficult time following their treatment regimens, as they are often given limiting labels such as noncompliant, unwilling to change, and unmanageable, amongst others (Narayan, 2016). These labels can negatively affect the quality and the future of their medical care. It is the responsibility of the healthcare team to help patients identify needs, then assist them in meeting them. Identifying patient needs is necessary to understand the patient's perspective of their DRD and the barriers they experience in complying with a medical regimen to improve glycemic control, reduce DRD, and increase quality of life.

**Patient Philosophical Assumption**

The patient is the other key philosophical concept of MRM theory. *Patient* can be identified under this theory as a holistic individual whose parts are interconnected and reliant upon one another for well-being (Smith & Parker, 2015). These interconnected parts consist of everything that is within a person and their ability to cope with the effects of their external environment (Smith & Parker, 2015). These constructs directly affect patient behavior. Behaviors are the effect of experience, coping mechanisms, beliefs, and values and are influenced by needs, both concrete and perceived. When needs are met or unmet, it influences behavior (Erickson et al., 1983/2009). Unmet needs related to diabetes care eventually result in elevated DRD and contributes to poor diabetes self-management and loosened glycemic control. Erickson emphasizes that coping ability is directly associated with whether needs are properly met (Smith & Parker, 2015). This emphasizes the importance of screening for DRD in all adults with type II diabetes with the DDS-17, as it specifically identifies the areas of need causing DRD and gives specific aims for interventions. Generally, as people's needs are met, their stressors decrease, which would ultimately result in decreased DRD (Erickson et al., 1983/2009).

**Guiding Principles of MRM: Modeling and Role-Modeling**

Principles that guide MRM theory include *modeling* and *role-modeling*. Erickson explains, "modeling is the process we use to build a mirror image of an individual's worldview. This worldview helps us understand what that person perceives to be important, what has caused his or her problems, what will help…" (Smith & Parker, 2015, p. 187). Modeling involves utilizing the patient's perspective to understand their needs and causes of DRD. This can be done by screening type II diabetes patients for DRD via self-report measures like the DDS-17, interpreting client responses to find where the needs are, and referring patients to the disciplines who are best suited to implement interventions that target the source of their DRD. If the patient's perspective is not at the center of their care, efforts will be minimally effective. By adhering to the modeling principle, the patient's perception and needs will be used to make the appropriate referrals within a primary care clinic utilizing a coordinated care approach.

*Role-modeling* is the process of interpreting the data that is collected and using it to design intentional interventions with definitive outcomes (Smith & Parker, 2015). This process took place within the primary care clinic by implementing the DDS-2 to all adults with type II diabetes. A positive DDS-2 resulted in the administration of the full DDS-17. After the patient completed the DDS-2, the results were assessed and a standardized protocol was used to refer them to the proper resources who can best target their sources of DRD. Information provided previously in this literature review highlights the abilities of these disciplines and their abilities to target and treat specific sources of DRD.

**Table 1**

*Diabetes-Related Distress Referral Algorithm*

| Elevated subcategory identified by DDS-17 | Appropriate referral for targeted intervention |
|---|---|
| Emotional Burden | Behavioral health therapist and Diabetes Self-Management Program class with RN health coach follow up |
| Physician-related distress | RN health coach, behavioral health therapist, and Diabetes Self-Management Program class with RN health coach follow up |
| Regimen-related distress | Dietician and Diabetes Self-Management Program class with RN health coach follow up |
| Interpersonal Distress | Behavioral health therapist and Diabetes Self-Management Program class with RN health coach follow up |

Application of the modeling role modeling theory is an excellent way for healthcare personnel to understand needs of DRD from the patient's perspective. An analysis of the data can ensure proper utilization of resources to assist patients in meeting their needs related to DRD. This focus encourages healthcare providers to meet patients where they are as well as understand that holistic care is not fully achievable if the patient's perspective of their needs in DRD is not the center of their treatment plans (Erickson et al., 1983/2009).

This PIP used the concepts of MRM theory to provide a framework to providing individualized, patient-centered care to individuals with DRD. The PIP emphasized the importance of patient perception in treatment plans and recognizes that patients' unmet needs are the driving force behind their behaviors (Smith & Parker, 2015). These needs can be identified by the DDS-17 and adequately treated within a primary care setting that uses a collaborative care approach (Snoek et al., 2015).

## Conclusion

The 2018 Standards of Medical Care in Diabetes issued by the ADA (2018b) recommends routine screening for DRD in patients with diabetes. They also advise that the best treatment approaches for diabetes is a collaborative one that includes multiple members of the healthcare team to provide support to the patient throughout their lifespan as they live and deal with diabetes (ADA, 2018b). Utilizing the entire healthcare team ensures that the patient is treated holistically and their needs and perceptions are placed at the center of their treatment plan when directed by the provider as the head of their healthcare team (Sweatman et al., 2016; Erickson et al., 1983/2009).

Diabetes is a condition that is becoming more prevalent and costlier every year (ADA, 2018a; Lin et al., 2018). With evidence showing that DRD is common amongst individuals with diabetes, is directly correlated with glycemic control, and is susceptible to intervention, it is imperative that healthcare institutions begin employing systematic approaches to identify and treat DRD (Fisher et al., 2012; Fisher et al., 2013; Perrin et al., 2017; Sweatman et al., 2016). Administration of the DDS-2 and DDS-17 can detect the presence and source of DRD (Fisher et al., 2008). Once the source is identified, referral to the appropriate, available resources will ensure individualized, patient-centered care that can decrease diabetes distress and ultimately improve patient outcomes in the form or A1c values in patients with type II diabetes (Fisher et al., 2013; Gonzalez et al., 2016; Snoek et al., 2015; Sweatman et al., 2016).

It is important for providers to instigate new, evidenced-based, treatment plans to increase quality of care due to new advanced payment models that emphasize payment structures based on quality measures, as opposed to quantity of patients seen (Sessums, McHugh, & Rajkumar, 2016). These quality care measures involve A1c values, which can be improved with

the implementation of this PIP. Providers can encourage a multidisciplinary approach that delegates tasks to other capable members of the healthcare team to accomplish goals surrounding quality of care. When A1c values improve, all parties benefit, including the provider, the healthcare institution, and, especially, the patient.

## CHAPTER THREE. PROJECT DESIGN AND IMPLEMENTATION

A key aspect in developing this project was aligning the goals with the design, implementation, and data collection methods to ensure the highest probability of successful outcomes (Ovretbeit et al., 2017). To do this, a logic model was created (Appendix F) to ensure project objectives functioned as a continual guide during the development of the project (CDC Division for Heart Disease and Stroke Prevention, 2017). Erickson, Tomlin, and Swain's theory of Modeling and Role Modeling functioned as the reason for developing a project that focuses on a difficult to manage disease, such as diabetes. This theory asserts that patient behaviors are driven by unmet needs and healthcare institutions need to provide services and resources in attempt to successfully meet these needs in order for patients to change their behavior and ultimately improve self-management of their health (Erickson et al, 1983/2009).

### Project Facilitation

A retrospective analysis of the number of patients with diabetes who were referred to interdisciplinary team members for continued support and education demonstrated low totals on a report issued to enterprise dieticians. Although the clinic had 306 empaneled patients with diabetes as of August 1, 2018, there were eleven patients referred to the on-sight dietician and diabetes educator in 2016 and nine in 2017. In August of 2017, the BHT implemented services via telehealth at the rural primary care clinic. In 2017 the BHT saw one patient with diabetes and five patients with diabetes in 2018.

A timeline of project facilitation can be found in Appendix G. Conversation with the RN health coach at the facility, who is responsible for managing care and tracking quality measures for all patients with chronic disease, revealed that a standardized system for referral was not in place but would be beneficial for patients with diabetes and the clinic alike to bolster better

outcomes. The RN health coach expressed interest in being part of a PIP to facilitate improved care management for patients with diabetes within the clinic.

On August 8, 2018 a meeting was held by the co-investigator with all administration staff of the rural medical center, including the chief executive officer (CEO) and nurse-leader of the clinic, and chief nursing operator (CNO) and the CEO of the attached hospital. The information on referral rates was presented along with current ADA recommendations for importance of multidisciplinary approach for optimizing diabetes care. Because the diabetic educator for the facility had retired recently, the question of which services were going to be available to patients was contemplated, including feasibility of hiring another diabetic educator. In addition, support of administration staff in the implementation of PIP was explored. The PIP was proposed to be coordinated by the RN health coach with focus on improving diabetes care by promoting delegation from providers to interdisciplinary care team members. This delegation would be evidenced by an increase in interdisciplinary visits for patients with type II diabetes.

Administration decided that because of current, low referral numbers to the diabetic educator, it was not financially wise to hire another. All administration members voiced support of a PIP that implemented a standardized procedure for integrating the interdisciplinary team into diabetes treatment within the clinic. They voiced two things they wanted considered when designing the project, including:

1. Better utilization of the current resources available at the rural, primary care clinic.
2. Efficiency in implementation to ensure the RN health coach does not accrue overtime.

Following the administration meeting, the co-investigator had a private meeting with each provider. Providers were told about the goals of reducing A1c values by delegating tasks to

fully competent interdisciplinary team members. Each provider voiced support of such a project. They currently had no suggestions to offer and voiced they would be supportive of any of their patients with type II diabetes participating in the project.

After being presented with the evidence behind screening for diabetes-related distress, the senior director of the clinic agreed that this is an aspect of diabetes care that should be included within the primary care clinic. The senior director stated that the clinic would implement the Diabetes Distress Screenings scales and referral algorithm as normal procedure within the clinic for a thirteen-month trial period and retrospective analysis of the data will be performed by the co-investigator to understand if benefits were observed.

Suggestions from administrative staff, recommendations by the ADA and CDC, and current research guided the development of the objectives for this PIP. The institution's benchmark A1c value of 8.0% was utilized. A key concept identified in the literature that had the potential to empower such a practice improvement project was DRD. Currently, DRD screening is recommended by the ADA and CDC for all adults with diabetes and compiled research suggests that identifying and treating DRD can significantly improve diabetes outcomes in the form of A1c values (ADA, 2018b; ADA, 2018c; CDC, 2017; Snoek et al., 2015; Sweatman et al., 2016). DRD can be accurately and efficiently identified with the use of the validated DDS-2 and, if applicable, the subsequent DDS-17 (Fisher et al., 2008; Fisher et al., 2012; Snoek et al., 2015). In the following sections, the project design details will be reviewed, including how the process will occur, followed by the necessary education staff members of the clinic will need to receive for the project to operate as planned. Next, the project timeline, evaluation plan and protection of human subjects will be outlined. The chapter will be concluded with information regarding the congruence of the project to the organization's strategic plan.

## Project Design

The project was designed around the evidenced-based concept DRD with a plan to create a structured referral system for patients with type II diabetes who are experiencing DRD that seeks to reduce the condition. The referral system was developed based upon current research that shows specific healthcare disciplines can positively affect patient self-management abilities and, thus, ultimately reduce DRD. See Appendix B for the referral algorithm. The PIP occurred over a 13-month span. The process was completed at annual physical or diabetes check appointments with each eligible patient, which included any patients 18-years of age and older with diagnosed type II diabetes.

Each day the RN health coach identified patients on provider schedules who were presenting for an annual physical or diabetes check appointment to ensure quality measures were met. For the PIP, the RN health coach continued to identify these patients and in addition identified which patients met eligibility criteria. The RN health coach then provided reception staff with a DDS-2 with a patient identification sticker on the top right corner. When a patient presented for their visit, the reception staff provided the forms to the patient for them to fill out. Any questions the patient had regarding the forms or the project was deferred by reception to the RN health coach who came to reception to meet with the patient. A private room to answer the patient's questions was offered. As with all self-report scales administered at this clinic, the patient completed these forms in the reception area while waiting for their appointment. This ensured patients were not filling out forms when the provider is performing the history and physical.

Next, the patient brought the forms to the exam room at the time of their appointment. The office nurse roomed the patient normally and evaluated the DDS-2 score. If the score was

below 2.0, indicating a negative score, the office nurse took the completed paperwork to the RN health coach following the patient appointment. The RN health coach then recorded the A1c value associated with the patient's visit and the date it was collected on the DDS-2.

When the office nurse identified that the score was greater than 2.0, indicating a positive screening, the office nurse called the RN health coach to meet with the patient immediately following the patient's visit with the healthcare provider. At that time, the RN health coach administered the DDS-17 to the patient. The RN health coach then scored the DDS-17 and used the referral algorithm to place the appropriate referrals in the patient's electronic chart to interdisciplinary team members who were delegated the task of treating DRD from the healthcare providers.

On the DDS-17, the RN health coach wrote which referrals were identified as being beneficial, as well as the A1c value associated with the visit and the date it was collected. During routine, monthly chart reviews of all patients with Type II diabetes, the RN health coach tracked A1c values and if patients attended interdisciplinary visits they were referred to. A check mark was placed next to the interdisciplinary team's name that was written on the DDS form to indicate that the patient attended the appointment. No check mark indicated that the referral was made but the patient did not attend the appointment.

After the necessary information, as referenced above, was written on the DDS forms by the RN health coach, a coding system was utilized to keep patient information confidential. The coding system involved a 4-digit code that was the last four digits of the patient's current phone number. This 4-digit code on the paperwork they fill out was necessary in order to correlate future DRD levels and A1c values with the same patient. The RN health coach kept a paper copy of this coding system in a locked file cabinet, it was not shared with anyone, including the co-

investigator. Once the code was placed, all patient identifiable information was cut off from the right-hand corner of the DDS forms. This occurred prior to giving all completed paperwork back to the co-investigator for data analysis.

Any paperwork related to the project was kept in a locked file cabinet in the RN health coach's office. This paperwork included DDS-2 and DDS-17 scales and the coding system sheet. Only the RN health coach and nurse leader of the clinic held a key to this cabinet.

**Healthcare Provider Staff**

The five healthcare providers at this rural, primary care clinic include one full-time internal medicine physician, one full-time family practice physician, one part-time family practice physician, one part-time physician assistant and one part-time nurse practitioner. Each provider was met with prior to project implementation, separately, and at appointment times suited to their convenience to review the project and education on DRD was provided (Appendix E). Due to difficulty with scheduling a time that works for all and low attendance at provider meetings, separate meetings was necessary. Provider compensation is based on production, so appointment times were scheduled directly with the providers during open slots in their patient schedules to ensure that provider productivity was not affected.

**Necessary Education for Healthcare Provider Staff**

Education in the informal provider appointments included objectives of the project, an explanation of the DRD condition, current ADA recommendations to identify and treat DRD, patient population inclusion criteria, integration of the RN health coach as the project coordinator, and how the process was to be completed with each patient. A fact sheet was provided to standardize each conversation and serve as a reference to the healthcare provider staff during the implementation of the project (Appendix E). In addition, the providers were

asked permission to tell their patients that they support the referrals identified. They were asked to delegate treatment of DRD to interdisciplinary staff members to save time and ensure their productivity was not affected in the treatment process. Three months following implementation, the co-investigator met with healthcare providers to answer any questions or concerns, none were identified.

**RN Health Coach Role**

The RN health coach, the main liaison within the PIP, was the main coordinator between patients, providers, nursing staff, reception, and the co-investigator. The RN health coach role carries a bachelor's degree in science and nursing and is trained to coordinate the care of individuals with chronic conditions within the clinic. Daily, the RN health coach looked at provider schedules to identify individuals with chronic conditions and ensure that quality measures are met, such as an A1c below 8.0%, a benchmark used by the healthcare institution. She met with many of these patients to offer support and education regarding self-management of their diseases. If an RN health coach is not available, the coordinator role of the project could be performed by a registered nurse who has access to patient information and is trained in coordinating care and educating individuals with chronic conditions.

**Necessary Education for the RN Health Coach**

Necessary education for the RN health coach to identify DRD with the use of the DDS-2 and DDS-17 and coordinate treatment involved identifying the appropriate population, instructions on scoring the DDS-2 and DDS-17, identification of which subscale is the source of the patient's DRD, and use of the referral algorithm to decipher which interdisciplinary visits may be beneficial in the treatment of that specific form of DRD. Within the patient's electronic medical record, the RN health coach placed the orders for the interdisciplinary visits identified.

Because entering referral orders were currently part of the RN heath coach role, no education was necessary on this topic.

**Confidentiality**. Next, the RN health coach was educated on the importance of all project information being kept confidential and stored in the locked file cabinet in her office. She individually coded each scale filled out by patients and cut off all patient names, MRN numbers or any data that could link the scale back to the patient before returning the scales to the co-investigator for analysis. The coding system used 4-digit codes that were the last four digits of the patient's current phone number to ensure a nonidentifiable method to ensure consistency in linking data for the duration of the PIP. The coding system was kept on a paper form that was kept in the locked file cabinet. This coding information was not shared with anyone, including the co-investigator.

**Direct education.** Another education piece necessary for success of the PIP involved direct education. Direct education is purposeful in nature and is meaningful to the patient that is receiving instruction. The RN health coach used direct education that focused on the source of DRD identified specific to that patient, offering information that is unique to them and the value of seeing an interdisciplinary team member who can help alleviate their type of DRD (Ovretveit et al., 2017). This education included recommendations from the referral algorithm, supported by their healthcare provider, and offered by the RN health coach.

In addition, direct education regarding finance issues was necessary. The RN health coach had a listing of the cost of each visit. This information was shared with the patient if paying for additional appointments was a concern. The RN health coach explained to the patient that there is evidenced based data showing benefit in the interdisciplinary visits that they are

being referred to in attempt to alleviate thoughts that additional visits are unnecessary and time consuming (Ovretveit et al., 2017).

**Scripting.** Another important concept that was reviewed with the RN health coach was scripting. Scripting involves offering specific information to the patient that is meaningful to their specific circumstances (Ovretveit et al., 2017). For example, "Because we found today that you are experiencing diabetes-related distress in the form of emotional burden, your healthcare provider thinks it's necessary you have a visit with the behavioral health therapist and attend the Diabetes Self-Management Program class to get the support you need to manage diabetes. Can I set up those appointments for you?" is more beneficial and was used instead of "Would you like to see the behavioral health therapist and attend the Diabetes Self-Management Program class?" Scripting that focused on the benefits that each individual patient can experience is correlated with better compliance in completing follow up appointments (Mavandadi, Wright, Klaus, & Oslin, 2018). Scripting was used only when asking the patient to participate in follow-up appointments as to not compromise individualized-patient centered care.

**Necessary Education for Office Nurses**

Next, office nurses were educated on identifying patients positive for DRD with use of the DDS-2. Appointment times were set up with individual nurses at a time suited to their convenience. A fact sheet was provided that standardized the education given and served as a reference throughout the remainder of the implementation of the project for the nurse (Appendix E). Instructions for calculating the DDS-2 average score (also provided in detail on each screening form) was then be provided. If the patient screened above the cut-point of 2.0, the office nurse called the RN health coach who came and meet with the patient immediately after their appointment with the healthcare provider. If the patient scored below 2.0, the importance of

getting the completed DDS-2 to the RN health coach was reviewed so that data could be kept in a locked file cabinet.

### Necessary Education for Reception Staff

Lastly, clinic reception staff were educated about their role in the PIP. They were given instruction on the importance of handing the DDS-2 form to each patient that had been identified by the RN health coach as an adult patient with type II diabetes when the patient is registering for their appointment. Reception staff were instructed to ask the patient to read and fill out the forms. Reception was instructed to direct any patient questions regarding the DDS-2 back to the RN health coach.

## Evaluation Plan

At all annual physical and diabetes check appointments (occurring every 3- or 6-months), patients were provided with the DDS forms. Next, the data collected by the RN health coach, as referenced above, was analyzed retrospectively. At the end of the implementation period, the co-investigator compared A1c values from initial referral and after services had been received with patient-reported levels of DRD from the DDS-17 forms. Special attention was given to whether patients attended recommended interdisciplinary visits. This was determined individually by the RN health coach as explained above and by an increase in referral rates to interdisciplinary team members on a larger scale. Determination was then made if the project successfully met the stated objectives.

## Protection of Human Subjects

Patients eighteen years of age and older with type II diabetes were prospective participants. The sample type was considered convenient and had no upper limits due to the total

number of patients with type II diabetes empaneled in the clinic being less than 350. Each patient was provided with the forms and held the right to refuse to fill them out.

**Potential Risks**

Potential risks that patients could have encountered during project implementation included loss of time and/or financial resources if patients did not learn any new/improved self-management tasks within the interdisciplinary visits. Loss of time could have included minutes spent filling out questionnaires as well as subsequent visits, which could be multiple hours. Loss of financial resources could involve out-of-pocket expenses and co-payments for interdisciplinary visits. Potential risks that the healthcare organization could have endured was loss of productive time by the RN health coach for time spent on the project. These potential risks were possible in the event that the PIP did not observe expected outcomes.

**Potential Benefits**

There are numerous potential benefits to patients if their A1c levels decreased through the project. According to the literature, an increase in quality of life, decreased number of years lived with disability, and decreased risk for significant financial burden related to healthcare costs is associated with decreased A1c values (Atif et all., 2018; Ramos et al., 2017). Research also suggests that employing an interdisciplinary team approach to chronic diseases such as diabetes is associated with increased patient satisfaction with their healthcare services, benefitting the patient as well as the healthcare institution (Berry et al., 2015; Wagner et al., 2017).

The healthcare institution has the potential to experience multiple benefits, also. Financially, lower diabetes care costs may be observed. Improvements in patient satisfaction scores will be part of the new Comprehensive Primary Care Plus (CPC+) payment model and

ensures a higher payment for services rendered to the patient (Center for Medicare and Medicaid Services [CMS], 2016; Center for Medicare and Medicaid Services [CMS], 2017). In the CPC+ payment model, lower A1c values is associated with higher quality payments (Atif et al., 2018; CMS, 2017). Financial benefits of the healthcare organization also affect the healthcare providers. With the CPC+ payment program, healthcare provider salaries will most likely be affected. There is the possibility that when lower payments are received by Medicare, physicians will see lower fee-for-service reimbursement as well as less incentivized dollars (CMS, 2017; Sessums et al., 2016).

In addition to financial benefits to the organization, all members of the healthcare team, including healthcare providers, nurses, and reception, employed at the clinic can potentially benefit. Implementing a project that improves usage of the services currently offered within the rural clinic can offer sustainability of those services, and, thus, increased job security. In addition, there is potential employees will experience increased job satisfaction. Evidence illustrates that healthcare team members allowed to practice to the fullest extent of their licensure report increased job satisfaction (Tricco et al., 2012; Wagner et al., 2017). Increased job satisfaction decreases staff turn-over, which can significantly impact overall morale of a workplace (Fletcher et al., 2018).

**North Dakota State University Institutional Review Board**

North Dakota State University Institutional Review Board determined the project to be exempt from human subject research in accordance with federal regulations (Code of Federal Regulations, Title 45, Part 46, Protection of Human Subjects) on March 19th, 2022.

### Sanford Health Institutional Review Board

The Sanford Health Review Committee approved the PIP and determined there was no need to use Sanford's additional IRB review process following determination of North Dakota State University Review Board's exemption.

## Congruence of the Project to the Organization's Strategic Plan

The goals of this PIP aligned with the clinic's initiatives to assist patients to improved health outcomes. The project facilitated the use of members of an interdisciplinary team that, together, can provide holistic and complete care to the patients of this clinic. Unmet needs are a driving force of patient behavior; meeting these needs with appropriate team members can result in increased patient ability to perform appropriate self-care tasks and result in better diabetes management (Erickson et al., 1983/2009).

In 2018, this rural, primary care clinic began participating in the advanced payment model, CPC+ Track 2. The goal of this new model is to improve care for individuals resulting in a healthier population (CMS, 2016). Within this new payment structure, providers will be compensated on quality measures as opposed to the quantity of patients seen (Sessums et al., 2016). One of these quality measures is poor glycemic control as evidenced by an A1c value greater than 9% (CMS, 2017). Clinics will be penalized in the form of smaller payments for services provided to patients with diabetes who have poor glycemic control (Sessums et al., 2016). In addition, clinics will be paid non-visit-based care management fees, called performance-based incentive payments, that are paid prospectively at the beginning of each calendar year. The clinic will also see comprehensive primary care payments, which are partially paid up-front on a quarterly basis (CMS, 2016; CMS, 2017). Clinics will be penalized by having to pay portions of these incentive payments back if they do not meet performance to measures,

such as improved A1c values and risk-adjusted hospital admission rates (Sessums et al., 2016). Prospectively paying these incentives is based on theory of loss aversion that clinical practices will intensify their efforts to improve patient care to ensure keeping all payments they receive (Sessums et al., 2016).

According to the literature, this evidenced-based PIP had the potential to successfully decrease DRD and subsequently, A1c values (Berry et al., 2015; Gonzaelz et al., 2016; Snoek et al., 2016; Sweatman et al., 2016). Better A1c values are associated with fewer complications, increased quality of life, and fewer hospital stays (Atif et al., 2018; Ramos et al., 2017). These reductions can assist the clinic's payment structure to keep their incentive payments as well as decrease the chances that smaller payments will be received for services provided to patients with diabetes (CMS, 2017). This payment structure directly affects the income of the healthcare provider, making it important that steps are taken to ensure initiatives to improve quality measures are driven by evidenced based recommendations, such as the ADA's recommendation to screen and treat DRD (ADA, 2018b; ADA, 2018c).

# CHAPTER FOUR. RESULTS

An analysis of the collected data was completed to determine the results from the PIP. This chapter will focus on the extent that objectives were met. Use of the logic model outputs prepared for this project will guide the discussion (Appendix F).

## Objective One

Adult patients with type II diabetes who screen positively for diabetes-related distress will have increased referral rates for support services within the primary care clinic, specifically, Diabetes-Self Management Program class, counseling by a behavioral health therapist, and/or dietician by March 1, 2020.

### Output: Number of Patients Screened for DRD and Number of Positive Screenings

Prior to the PIP implementation, no patients were being screened for DRD in the rural clinic, though it's recommended by the ADA. During the nine months of implementation (June 1, 2019 to March 1, 2020), 149 patients were screened for DRD using the DDS2. Of these screened patients (N=149), 32% (n=48) of patients screened positively for DRD on the DDS2, indicating a DDS17 would be necessary. Of these 48, 13 patients refused to fill out the DDS17 forms in its entirety or were not given the second DDS17 scale by clinic staff when the RN health coach was absent. The remainder of the positive cases completed the DDS17. The DDS17 provided data on which type of distress the patient was experiencing and perpetrated the use of the referral algorithm to the appropriate service within the clinic.

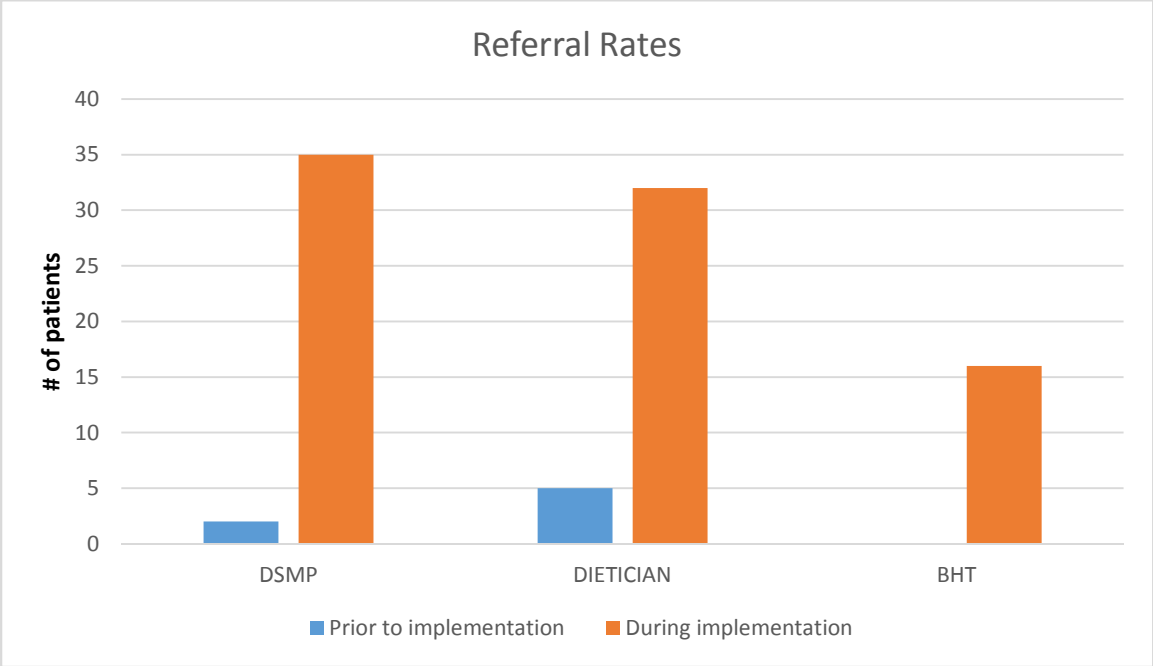
### Output: Number of Referrals to Dietician, Behavioral Health Therapist, and Diabetes Self-Management Program Class

Referral numbers were investigated for the nine months (September 1, 2018 to May 31, 2019) prior to the implementation of the PIP to compare to the nine months of implementation of

the PIP. *Figure 1* depicts referral rates prior to and during the implementation of the PIP. Because the results were not statistically significant, descriptive statistical analysis were not utilized, rather graph format was a more appropriate way to present the data results.

**Figure 1**

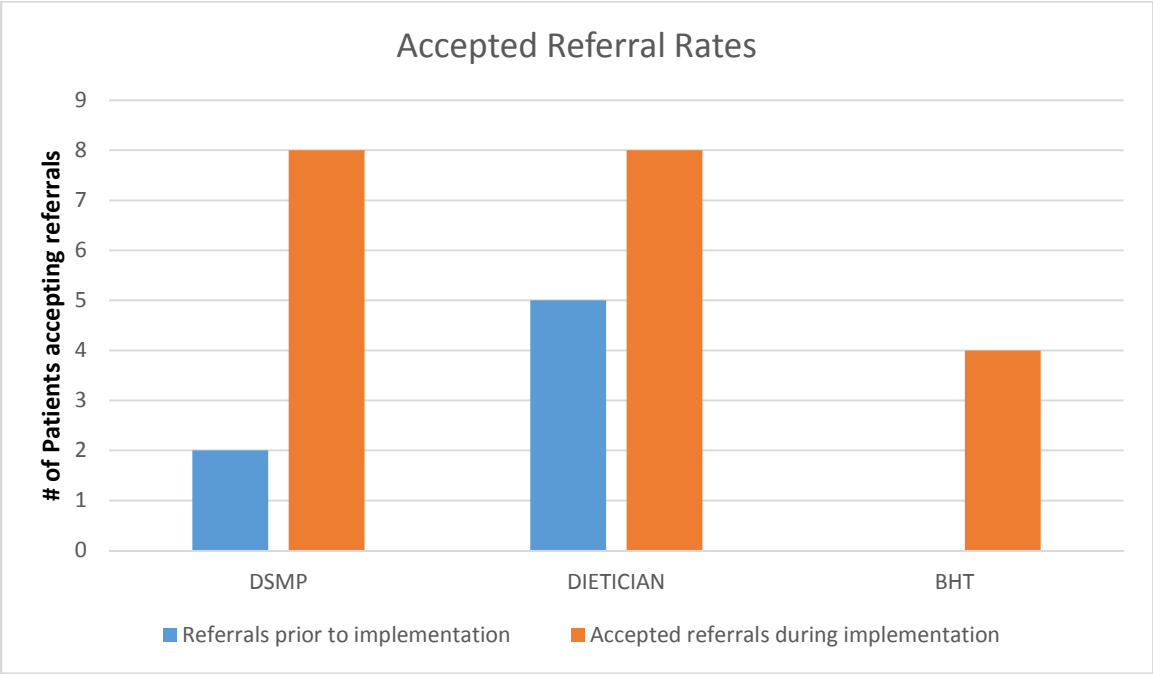
*Referral Rates*




The accepted referral rate is introduced in *Figure 2* and indicates how many patients agreed to go to the appointments. Among patients who agreed to attend the interdisciplinary appointments, referral rates increased from two to eight patients for DSMP, from five to eight patients for the dietician, and from zero to four patients for the BHT.

**Figure 2**

*Accepted Referral Rates*




## Objective Two

Patients who adhere to the referral process and attend recommended appointments will have decreased diabetes-related distress scores.

### Output: Number of Times Each Patient was Screened

The number of times each patient was screened was variable. Recommendations for return to clinic for diabetes appointments was based on the preference of the provider as opposed to a systematic approach that was not able to be identified by the co-investigator in order to determine a set point in time that was best to screen patients in follow-up for improved standardization. In addition, patients do not always return for follow up when recommended and there was a failure of some patients to be re-screened for DRD when returning for appointments. Although the implementation period ceased March 1, 2020, A1c data continued to be collected until June 1, 2020. Due to the global pandemic with Coronavirus, no additional DRD scores were

obtained on or after March 1, 2020 in an attempt to decrease transmission of the virus that could occur from multiple staff and the patient touching screening forms and no electronic availability due lack of electronic resources in the rural clinic.

Of the 35 patients who successfully completed the DDS17, 11 of these patients complied with recommended follow-up appointments. Of these 11 patients, two did not have a follow up appointment during the data collection period, thus no DRD score was obtained. Six of the 11 had follow up appointments but were not given the DDS forms. The remaining three patients were re-screened for DRD at a follow up appointment and will be the emphasis of the results for this objective. Follow up data displayed in Table 2 reveals that patient 2 did have a decreased DRD score, while patients 7 and 10 had an increase.

**Table 2**

*Follow Up Diabetes Related Distress Scores from DDS17*

| Patient Number | Initial DDS Score | Referrals | Length of time to follow up appointment | Follow up DDS Score |
|---|---|---|---|---|
| 2 | Total: 1.94<br>EB: 2.0<br>RD: 2.6<br>ID: 2.0 | Dietician<br>Refused DSMP | 3 months | Total: 1.4 |
| 7 | Total: 2.82<br>EB: 4.6<br>RD: 2.8<br>ID: 2.3 | Dietician<br>DSMP<br>BHT | 9 months | Total: 2.94<br>EB: 4.6<br>RD: 3.2<br>ID: 2.3 |
| 10 | Total: 1.53<br>EB: 2.2 | DSMP<br>BHT | 2 months | Total: 2.18<br>EB: 3.0<br>RD: 2.6 |

## Objective Three

The number of patients identified as having diabetes related distress with an A1c value greater than 8.0%, who attend recommended appointments, will decrease their A1c to below 8.0%.

### Output: A1c Values

Of the 11 patients who complied with recommended follow-up appointments, nine had follow-up A1c values within the data collection timeframe. Five of the patients had initial A1c values less than 8.0%, a value used by this clinic as a success benchmark. The data from these five patients will also be presented in the following table and discussion of values will be made in Chapter Five. The remaining four patients had an initial A1c value greater than 8.0% and will be discussed in detail here due to the relation to the objective.

Of the four patients with initial A1c values greater than 8.0%, Patient 6 had an increased A1c value at the next follow up visit. Patient 10 had an A1c greater than 8.0% and fell below this benchmark at a 2-month follow up but was higher than 8.0% again at four- and six-month return visits. Patients 8 and 9 fell below the 8.0% benchmark at follow up visits. This results in 50% success meeting the objective. A visual aid of the data is presented in Table 3.

**Table 3**

*Follow Up A1c Values in Patients Identified as Having DRD Who Accepted Recommended Appointments*

| Patient Number | Initial A1c | Referrals | Length of time to follow up appointment | Follow up A1c |
|---|---|---|---|---|
| 2 | 7.6% | Dietician<br>Refused DSMP | 3 months | 7.2% |
| 4 | 7.4% | Dietician<br>DSMP<br>BHT | 6 months | 9.5% |
| 5 | 6.6% | DSMP<br>BHT | 1 year | 7.0% |
| 6 | 8.1% | Dietician<br>DSMP<br>BHT | 3 months<br>9 months | 9.6%<br>13.9% |
| 7 | 7.7% | Dietician<br>DSMP<br>BHT | 9 months<br>12 months | 7.4%<br>7.3% |
| 8 | 8.3% | Dietician<br>DSMP<br>BHT | 6 months<br>9 months | 7.8%<br>7.5% |
| 9 | 8.3% | Dietician<br>Refused DSMP<br>Refused BHT | 3 months | 5.3% |
| 10 | 8.2% | DSMP<br>BHT | 2 months<br>4 months<br>6 months | 7.7%<br>8.7%<br>8.7% |
| 11 | 7.5% | BHT<br>DSMP | 6 months | 6.8% |

A relationship between DRD and A1c values was observed in two patients with the highest DDS scores as depicted in Table 4. Initially, A1c values were within goal for both patients who reported high levels of DRD. At six-month follow up, Patient 4 experienced a 28%

increase in A1c value, while Patient 6 experienced a 71% increase at nine-month follow up. Although the data set is too small to make inferences about the results, this data correlates with the literature that states that high levels of DRD forecasts future A1c values (Aikens, 2012; Snoek, 2015; Sweatman et al., 2016).

**Table 4**

*Moderate to Severe Diabetes Related Distress in Relation to Hemoglobin A1c Values*

| Patient code | Initial DDS score | Initial A1c value | Length of time to follow up appointment | Follow up A1c value |
|---|---|---|---|---|
| 4 | Total: 3.0<br>ED: 3.8<br>RD: 3.0<br>ID: 4.0 | 7.4% | 6 months | 9.5% |
| 6 | Total: 3.76<br>EB: 5.0<br>RD: 4.2<br>ID: 2 | 8.1% | 3 months<br>9 months | 9.6%<br>13.9% |

# CHAPTER FIVE. DISCUSSION AND RECOMMENDATIONS

This chapter will discuss the individual outcomes from the logic model that were derived from the objectives. Next, the impact the PIP has on clinical practice will be considered. The chapter will end with recommendations, limitations, strengths, the dissemination plan, and the specific impact the PIP has on the role of the nurse practitioner.

## Short-Term Outcomes

For short term outcomes, Objective One and Two were addressed. Objective One was to use the DDS form to screen for DRD in order to direct which referrals would be beneficial, thus increasing the referral rates. Objective Two was to decrease DRD scores, which required staff education. Before the PIP implementation, all clinic staff were met with separately to review DRD, it's subtypes, and the referral system. All staff were unfamiliar with the concept. Both the DDS2 and the DDS17 scales were reviewed with each person and a short handout was provided to each staff member for easy reference (Appendix E) to increase awareness of DRD as a treatable condition.

Staff members voiced confidence in administering the scales and appreciation for a tool to guide conversations with patients with diabetes who were requiring extra assistance as indicated by an increased level of DRD. When each staff member was met with every three-months during implementation, each voiced ease of use with the scale. Each staff member also reported appreciation for the scales due to finding patients who screened highly on the form but have not mentioned issues or questions in past visits, ultimately instigating healthcare providers and nurses to have conversations related to the patients concerns that they felt would not have happened without the DDS scales.

At each three-month check-in visit with staff, no concerns were communicated, and they reported comfort in administering the scale and the referral process. In addition to these findings, healthcare providers in the clinic voiced appreciation for the scale, as the scale was felt to ultimately save time within diabetes visits as well as identify patients who were at a higher level of engagement evidenced by their recognition of a problem with their diabetes regimen on the DDS forms. Healthcare providers also acknowledged that streamlining referrals would ensure that engaged diabetic patients were offered the clinic's available resources.

**Begin Screening Patients for DRD in the Primary Care Clinic**

The initiation of the project and administering DDS scales to each patient with diabetes at relevant appointments went smoothly on the start date of June 1, 2019. The RN health coach ensured that each patient with diabetes listed on their chart that was coming in for an annual physical or diabetes check appointment got a DDS2 screening form in the front lobby. Unfortunately, in September of 2019 the RN health coach resigned. The newly hired RN health coach did not get started in the role until December of 2019 causing inconsistencies in the data collection.

Because the application of the scales and the referral system were implemented as common practice within the clinic, the office nurses continued with the scales to the best of their abilities, but reported that without the RN health coach, their responsibilities increased, spreading them too thin to always get the scales administered and identify which patients needed them. Once the new RN health coach began, administration of the scales was difficult as she became acclimated to the job that entails multiple other responsibilities outside of diabetes care. During the time lapse between RN health coaches, the Nurse Lead of the clinic was responsible for putting the scales into the locked cabinet. When the new RN health coach started, she was

able to have a short orientation with the prior RN health coach regarding the PIP. The new health coach was made aware of the confidentiality practices of the PIP and was able to adhere to them as to not jeopardize the confidentiality of the patients to the co-investigator.

Initially, the project was to occur until July 1, 2020 but due to the novel Coronavirus, clinic operations were vastly changed. These changes included restriction of patients within the clinic for health maintenance appointments and stopping any referrals to reduce patient/staff contact in an effort to prevent the spread of the virus. Administration of self-report patient scales, including the DDS, stopped. Due to this unfortunate event, implementation of the PIP ceased on March 1, 2020.

## Intermediate Outcomes

### Identified DRD Will Facilitate Appropriate Referrals Within the Primary Care Clinic

Intermediate outcomes resulted from Objectives One and Three, to increase referral rates to available interdisciplinary staff members to ultimately lower hemoglobin A1c values, more specifically, lowering the number of patients with A1c values greater than 8.0%. Over a nine-month period, the PIP successfully identified 48 individuals with DRD in a clinic who hadn't screened for the condition previously. Identifying DRD in individuals can have a significant impact on patient care. Not only were important conversations initiated related to specific concerns within an individual's diabetes regimen, but the two highest DDS scores within the clinic also correlated with A1c increases.

According to researchers Fisher et al. (2012), a total score of 3.0 or higher total score or within any subcategory is categorized as moderate to severe distress. Two individuals within the project scored 3.0 or higher on the DDS scale at initial appointments. At this initial visit where high distress was reported, A1c values were within goal and less than 8% but at follow up

appointments significant increases occurred. At six-month follow up, Patient 4 experienced a 28% increase in A1c value, while Patient 6 experienced a 71% increase at nine-month follow up as depicted in Table 4. Although the data set is too small to make inferences about the results, this data correlates with the literature that states that high levels of DRD forecasts future A1c values (Aikens, 2012; Snoek, 2015; Sweatman et al., 2016).

Although neither of these patients had follow up DDS scores, the A1c value was accurately predicted to elevate significantly. Both Patients 4 and 6 did agree to attend the referred visits with interdisciplinary team members to treat their DRD. This could potentially indicate that one visit with interdisciplinary staff member is not enough to prevent an increase in A1c value when distress is high. Literature suggests that highly distressed individuals are more likely to benefit from frequent contact with the healthcare team, including multiple interdisciplinary visits as well as increased contact via phone calls and/or in person visits with the RN health coach, the interdisciplinary team, and the healthcare provider.

## Long Term Outcomes

### Increase in the Number of Patients Screened for DRD and the Number of Patients Referred to Available Resources- DSMP, Dietician, and BHT

The long-term outcomes correlated with Objective One, to increase the referral rates of patients with type II diabetes with DRD to interdisciplinary staff members to treat the condition. On May 31, 2019, the day before implementation, a report revealed that 308 patients seek primary care at this clinic with a diagnosis of diabetes on their chart. During implementation of the PIP, the number of patients screened for DRD within the primary clinic was 149 as opposed to zero. Literature from the Center for Public Health Quality (CPHQ) supports extending implementation periods over a greater time period to ensure a greater number of individuals are

affected by a PIP, and in this case, screened for DRD (CPHQ, 2020). The future goal of the clinic is to screen all empaneled patients and exert confidence to the patients in its ability to guide and facilitate better outcomes in diabetes care.

There were 35 DDS17 scales completed that were positive. Of these 35 individuals, 11 agreed to the referral services, implying that 69% of individuals refused to attend any interdisciplinary care visits. Two reasons patients reported to the RN health coach when refusing to attend appointments was a lack of time to return for follow up appointments and fear of cost of the visits. Although the RN health coach did have access to cost of visits, patients were skeptical of the numbers because of past experiences in charge discrepancies, suggesting that insurance coverage is complicated.

## Impacts

The impacts established on the logic model (Appendix F) were reflective of the purpose of this PIP. Developing a sustainable, efficient method to identify DRD and the appropriate referrals to increase collaborative care and usage of preexisting services within clinic were posed to decrease DRD, improve hemoglobin A1c values, improve usage of services offered, and ultimately impact the overall health status of patients with type II diabetes. Of the three patients that had follow up DDS scores ranging from two to nine months, one patient had a decrease while two experienced an increase. Within the population of nine patients with follow up A1c values at follow up appointments ranging from two to twelve months, five patients experienced a decrease while four experienced an increase in scores. The small population size and variable results make a global determination regarding the PIP impact on patient care impractical in this clinic from this PIP alone. Although A1c nor DDS scores consistently decreased amongst

patients who attended the visits, the RN health coach reported patients verbalized satisfaction with the visits with interdisciplinary staff members.

Additionally, an impact regarding sustainability of the program looked at the possibility of financial impact for both the patient and the healthcare institution. Ultimately, better controlled diabetes is associated with cost effectiveness for the patient, preserving financial resources, as well as the organization whose compensation for healthcare is tied to outcomes such as hemoglobin A1c values. The program did observe a 50% reduction in the number of patients with an A1c greater than 8.0% when they attended recommended appointments. Because the population was four patients, it is not possible to say that this program can specifically impact financial resources of a general population of patients or the institution.

## Limitations

The presence of the Coronavirus global pandemic reduced the intended timeline of project implementation and data collection, which likely affected results due to a less than anticipated data collection opportunity. Fortunately, data collection ceased before major shutdowns and threats of the pandemic were in this geographical area and didn't affect the scores obtained. Further limitations included nursing staff turnover and variability in follow up timeframes. These limitations ultimately lead to difficulty with complete data collection. Unfortunately, because of the small sample size, statistical significance was unable to be determined.

The reduced timeline and staff turnover directly affected the number of patients with diabetes who were screened for DRD. In addition, 24 out of 35 patients refused to attend any of the recommended interdisciplinary team visits, indicating a need for further investigation to improve patient agreement for expanding their care team. Specific, evidenced based education

regarding the beneficial impact in the addition of interdisciplinary team members into the plan of care may help patients realize it's worth and time well-spent. In addition, although a price sheet is available for use, it apparently is not trusted by patients. In retrospect, more study of insurance coverage and how clinic staff can efficiently access correct information could have had the potential to increase the number of patients included in analysis.

Variability amongst the healthcare providers for preference of patient return times made data analysis difficult. Provider preference varies significantly regarding diabetes follow up and caused difficulty comparing one patient to the next. Patient noncompliance to those recommendations further complicated the follow up timeline.

The survey itself experienced a limitation as well. Out of 149 completed DDS2 scales, 19 were falsely positive after the complete DDS17 form was completed. According to research, the DDS2 has a 97% sensitivity rate in detecting DRD with a 3.3% false positive rate (Fisher et al., 2008). In this population, approximately 13% of patients screened positively on the DDS2 but then negatively on the DDS17. Interestingly, the two questions listed in the DDS2 are also on the DDS17. Patients marked a lower score on these two questions on the DDS17 than they did on the DDS2, causing the false-positive result from the DDS2 form.

## Recommendations for Project Site

Although there was not a high enough population to make inferences about the data to apply to the general population or regarding benefits of the institution, the data shows promise that if the PIP could have progressed over a longer period of time, a larger number of patients could have been impacted (Ovretveit et al, 2017). The co-investigator recommends that the clinic continue to administer the scales and refer to interdisciplinary staff to meet the unique needs of patients with diabetes who are experiencing DRD.

Continuation of the DRD screening process should be changed in order to affect more individuals. First, the number of declined referrals should be addressed with focus on time constraints and fear of costs. To save patient time, interdisciplinary visits could be offered via telehealth services or offered immediately following the visit with the primary care provider as opposed to asking the patient to return to the clinic at a later time and date. These accommodations have been made in the past and more effort could be placed on offering it anytime it is possible for that interdisciplinary team member.

To address fear of cost, the organization could offer free first-time visits to interdisciplinary team members, which would support the staff's explanation of the positive gain the patient may experience as part of their treatment plan (Mavandadi, Wright, Klaus & Oslin, 2018). In addition, instead of giving patients a generic cost sheet, the RN health coach could obtain CPT codes for the interdisciplinary team visits to supply to patients. With the CPT codes, patients could more easily obtain information from their insurance company regarding coverage.

According to this small set of data, one visit with each interdisciplinary staff member is not enough to reduce DRD levels. Because research is lacking on specific numbers of required visits, the clinic could obtain the opinion of each interdisciplinary staff member and encourage patients to attend a specified number of visits with that discipline. Expert opinion outside of this clinic could also be sought by another primary care clinic screening for DRD or from the diabetic education office.

In the event that DRD levels remained high or A1c changes were not observed, the coinvestigator would recommend adding diabetic educator services. Researchers Ward, Eustice, Nawarskas, and Resch (2018) found that diabetes educators were able to assist patients in decreasing A1c values more than any other discipline or primary care visits alone. Although this

primary care clinic does not have a diabetic educator on staff, offering this service via telehealth would add to the resources the clinic is able to offer and allow patients to remain close to home.

Administration of the scales could occur at a different time. The office nurses could administer the DDS2 after the patient has met with the healthcare provider and been told their A1c value. In this PIP, the screening scale was given prior to meeting with the healthcare provider. The full version, DDS-17 was administered after meeting with the healthcare provider when the RN health coach met with the patient. Some individuals may be more distressed after the visit with the healthcare provider due to unexpected A1c value increases and more could have screened positively. Under these circumstances, more patients would have screened positively on the DDS2 and more DDS17 scores would have been observed.

Lastly, frequent follow-up care is required of those individuals who are experiencing moderate to severe levels of DRD as evidenced by a total score or any subcategory score of 3.0 or higher. As referenced earlier, high DRD levels forecast future A1c values (Aikens, 2012; Snoek, 2015; Sweatman et al., 2016). Early intervention is key to preventing the A1c value increase. Patients could benefit from weekly phone calls from the RN health coach along with monthly or quarterly visits with the healthcare provider to review blood sugars (Wagner et al., 2017).

## Dissemination Plan

Dissemination of the knowledge gained from this PIP will be administered via an executive summary to all staff and administration of this primary care clinic. In addition, the nurse manager of the clinic will present the executive summary at the regional clinic meeting so that other rural clinics can have access to the information and recommendations. Lastly, the

coinvestigator will present the information in poster form at NDSU College of Health Professions Poster Session in 2022.

## Implications for Future Research

Recommendations for replication of this project for graduate researchers include increased preparation to offset potential barriers of patients attending interdisciplinary appointments. Significant research should occur as well as expert opinion obtained to find the best way to present interdisciplinary visits to patients who seek care at a rural, primary healthcare clinic. In addition, it would be beneficial to assess how social determinants of health, such as patient transportation, food access/insecurity, etc., may impact their chronic disease and play a role in their ability to self-manage their disease. Social determinants of health could be considered in relation to the DDS scores patients report.

Although recommendation to the site includes screening as many patients for DRD as possible, for replication purposes in the form of another PIP, the National Association for Healthcare Quality recommends implementing with one provider as it will most likely provide more reliable results, especially in the event that DRD is a completely new concept to a facility (CPHQ, 2020). If this PIP project was replicated at the same rural, primary care clinic, the recommendation would be to include all healthcare providers because they have already been exposed to the condition of DRD and the scales, but more emphasis placed on patient acceptance of referrals to interdisciplinary visits. It would also be of benefit to incorporate literature that clearly defines the best timing for administering screening scales at a primary care clinic visit to bolster reliability and best practice for implementation.

## Application to Nurse Practitioner Role

The DNP role of leader was exhibited in this project by taking recommendations from evidenced-based literature and implementing them into practice. This was a completely new concept for the rural, primary care clinic and manifested crucial conversations regarding diabetes care between patients and their healthcare providers, nurses, and interdisciplinary staff. Next, the DNP role of educator was demonstrated through educating providers and staff regarding the condition, DRD, and the importance of screening and how it had the potential to impact patient care and outcomes. Lastly, the DNP role of patient advocate was exemplified throughout this PIP that was driven by Helen Erickson's Modeling and Role Modeling theory that operates on the premise that patient noncompliance is driven by unmet needs, needs that can be identified and addressed within primary care clinics.

The research, development, implementation, evaluation, and dissemination of this PIP facilitated the growth in fundamental characteristics required of a Doctor of Nursing Practice (DNP) role. The DNP is held to the highest standard of care amongst the nursing field and is charged with providing evidence-based practice. Currently, the ADA recommends screening and treating DRD, a task that nurse practitioners should champion due to their curriculum emphasis on health promotion and disease prevention. Screening for DRD identifies patients who are engaged and seeking help with their diabetes self-care regimen. This provides an excellent opportunity for nurse practitioners to exert their expertise to satisfy patient unmet needs and improve healthcare.

## Conclusion

Diabetes is increasing in prevalence and has detrimental health effects on patients. Improving diabetes care is an essential task of healthcare providers because patient quality of life

and the state of their financial resources have been linked to how well their diabetes is controlled. Providers have a unique opportunity to better understand the barriers patients experience and improve diabetes care when their perspective is challenged by theory.

Helen Erickson's theory of Modeling and Role Modeling can inspire providers to approach diabetes care in a new way that motivated this PIP. The theory emphasizes the importance of unconditional acceptance and empathy from healthcare providers and challenges them to view diabetes care from the patient's perspective. It asserts that the patient's self-care behaviors and diabetes regimen are driven by unmet needs. Needs that can be identified with the use of the DDS scales. With an empathetic approach and identification method to expose unmet needs, the healthcare provider is empowered to foster a holistic approach that can improve diabetes care and the overall health status of a multitude of individuals.

## REFERENCES


Aikens, J. E. (2012). Prospective associations between emotional distress and poor outcomes in type II diabetes. *Diabetes Care*, *35*(12), 2472-2478. doi: 10.2337/dc12-0181

Ali, M. K., Bullard, K. M., Saaddine, J. B., Cowie, C. C., Imperatore, G., & Gregg, E. (2013). Achievement of goals in U.S. diabetes care, 1999-2010. *New England Journal of Medicine*, *368*(17), 1613-1637. doi: 10.1056/NEJMsa1213829

American Diabetes Association [ADA]. (2018a). Economic costs of diabetes in the U.S. in 2017. *Diabetes Care*, *41*(5), 917-928. doi: 10.2337/dci18-0007

American Diabetes Association [ADA]. (2018b). Introduction: Standards of medical care in diabetes-2018. *Diabetes Care*, *41*(1), S1-S2. doi: 10.2337/dc18-SINT01

American Diabetes Association [ADA]. (2018c). Standards of medical care in diabetes – 2018 abridged for primary care providers. *Clinical Diabetes, 36*(1), 14-37. doi: 10.2337/cd17-0119

Anderson, R. T., Venkat Narayan, K. M., Feeney, P., Goff, D., Ali, M. K., Simmons, D. L., Sperl-Hillen, J., Bigger, T., Cuddihy, R., O'Conner, P. J., Sood, A., Zhang, P., & Sullivan, M. D. (2011). Effect of intensive glycemic lowering on health-related quality of life in type II diabetes ACCORD trial. *Diabetes Care*, *34*(4), 807-812. doi: 10.2337/dc10-1926

Asuzu, C. C., Walker, R. J., Williams J. S., & Egede, L. E. (2017). Pathways for the relationship between diabetes distress, depression, fatalism, and glycemic control in adults with type II diabetes. *Journal of Diabetes and Its Complications*, *31,* 169-174. doi: 10.1016/j.jdiacomp.2016.09.013

Atif, M., Saleem, Q., Babar, Z., & Scahill, S. (2018). Association between the vicious cycle of diabetes-associated complications and glycemic control among the elderly: a systematic review. *Medicina, 54*(5), 73. doi: 10.3390/medicina54050073

Baek, R. N., Tanenbaum, M. L. & Gonzalez, J. S. (2014). Diabetes burden and diabetes distress: The buffering effect of social support. *Annals of Behavioral Medicine, 48*, 145-155. doi: 10.1007/s12160-013-9585-4

Berry, E., Lockhart, S., Davies, M., Lindsay, J. R., & Dempster M. (2015). Diabetes distress: Understanding the hidden struggles of living with diabetes and exploring intervention strategies. *Postgraduate Medical Journal*, *91*(075), 278-283. doi: 10.1136/postgradmedj-2014-133017

Beverly, E. A., Ivanov, N. N., Court, A. B., & Fredricks, T. R. (2017). Is diabetes distress on your radar screen? *The Journal of Family Practice, 66*(1), 9-14.

Center for Public Health Quality. (2020). *Step by step guide to implement quality improvement*. Retrieved from http://www.amchp.org/Transformation-Station/Documents/QI%20Step%20by%20Step%20Guide.pdf

Center for Substance Abuse Treatment. (2008). *Managing depressive symptoms in substance abuse clients during early recovery: Treatment improvement protocol*. Retrieved from https://www.ncbi.nlm.nih.gov/books/NBK64057/

Center for Disease Control and Prevention [CDC]. (2017). *National diabetes statistics report, 2017*. Retrieved from https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf

Center for Disease Control and Prevention [CDC] Division for Heart Disease and Stroke Prevention. (2017). *Evaluation guide: Developing and using a logic model*. Retrieved from https://www.cdc.gov/dhdsp/docs/logic_model.pdf

Center for Disease Control and Prevention [CDC] National Center for Health Statistics. (2011a, November 8). *Healthy People 2010*. Retrieved from https://www.cdc.gov/nchs/healthy_people/hp2010.htm

Center for Disease Control and Prevention [CDC] National Center for Health Statistics. (2011b, October 14). *Healthy People 2020*. Retrieved from https://www.cdc.gov/nchs/healthy_people/hp2020.htm

Centers for Medicare and Medicaid Services [CMS]. (2016, December 15). *Comprehensive primary care plus (CPC+) 2018 payer and practice solicitation*. Retrieved from https://www.cms.gov/newsroom/fact-sheets/comprehensive-primary-care-plus-cpc-2018-payer-and-practice-solicitation

Centers for Medicare and Medicaid Services [CMS]. (2017, December 1). *CPC+ payment methodologies: Beneficiary attribution, care management fee, performance-based incentive payment, and payment under the Medicare physician fee schedule for program year 2018, version 1*. Retrieved from: https://innovation.cms.gov/Files/x/cpcplus-methodology.pdf

Chawla, A., Chawla, R., & Jaggi, S. (2016). Microvascular and macrovascular complications in diabetes mellitus: Distinct or continuum? *Indian Journal of Endocrinology and Metabolism, 20*(4), 546-551. doi: 10.4103/2230-8210.183480

Chrvala, C. A., Sherr, D., & Lipman, R. D. (2016). Diabetes self-management education for adults with type II diabetes mellitus: A systematic review of the effect on glycemic

control. *Patient Education and Counseling, 99*(6), 926-943. doi: 10.1016/j.pec.2015.11.003

Erickson, H. C., Tomlin, E. M., & Swain, M. P. (2009). *Modeling and Role-Modeling*. Cedar Park, TX: EST Company. (Original work published 1983).

Fisher, L., Skaff, M. M., Mullan, J. T., Arean, P., Mohr, D., Masharani, U., Glasgow, R., & Laurencin, G. (2007). Clinical depression versus distress among patients with type II diabetes: Not just a question of semantics. *Diabetes Care*, *30*(3), 542-548. doi: 10.2337/dc06-1614`1

Fisher, L., Glasgow, R. E., Mullan, J. T., Skaff, M. M., & Polonsky, W. H. (2008). Development of a brief diabetes distress screening instrument. *Annals of Family Medicine, 6*(3), 246-252. doi: 10.1370/afm.842

Fisher, L., Glasgow, R. E., & Strycker, L. A. (2010a). The relationship between diabetes distress and clinical depression with glycemic control among patients with type II diabetes. *Diabetes Care*, *33*(5), 1034-1036. doi: 10.2337/dc09-2175

Fisher, L., Mullan, J. T., Arean, P., Glasgow, R. E., Hessler, D., & Masharani, U. (2010b). Diabetes distress but not clinical depression or depressive symptoms is associated with glycemic control in both cross-sectional and longitudinal analyses. *Diabetes Care*, *33*(1), 23-28. doi: 10.2337/dc09-1238

Fisher, L., Hessler, D. M., Polonsky, W. H., & Mullan, J. (2012). When is diabetes distress clinically meaningful? Establishing cut points for the Diabetes Distress Scale. *Diabetes Care*, *35*(2), 259-264. doi: 10.2337/dc11-1572

Fisher, L., Hessler, D., Glasgow, R. E., Arean P. A., Masharani, U., Naranjo, D., & Strycker, L. A. (2013). REDEEM: A pragmatic trial to reduce diabetes distress. *Diabetes Care*, *36*(9), 2551-2558. doi: 10.2337/dc12-2493

Fisher, L., Gonzalez, J. S., & Pononsky, W. H. (2014). The confusing tale of depression and distress in patients with diabetes: a call for greater clarity and precision. *Diabetic Medicine, 31*(7), 764-772. doi: 10.1111/dme.12428

Fletcher, L., Carter, M., & Lyubovnikova, J. (2018). Congruency of resources and demands and their effects on staff turnover within the English health care sector. *Journal of Occupational and Organizational Psychology, 91*(3), 688-696. doi: 10.1111/joop.12214

Franz, M. J., MacLeod, J., Evert, A., Brown, C., Gradwell, E., Handu, D., Reppert, A., & Robinson, M. (2017). Academy of Nutrition and Dietetics Nutrition practice guideline for type 1 and type II diabetes in adults: Systematic review of evidence for medical nutrition therapy effectiveness and recommendations for integration into the nutrition care process. *Journal Academy of Nutrition and Dietetics*, *117*(10), 1659-1679. doi: https://doi.org/10.1016/j.jand.2017.03.022

Gonzalez, J. S., Delahanty, L. M., Safren, S. A., Meigs, J. B., & Grant, R. W. (2008). Differentiating symptoms of depression from diabetes-specific distress: relationships with self-care in type II diabetes. *Diabetologia*, *51*(10), 1822-1825. doi: 10.1007/s00125-008-1113-x

Gonzalez, J. S., Shreck, E., Psaros, C., & Safren, S. A. (2015). Distress and diabetes treatment adherence: A mediating role for perceived control. *Health Psychology*, *34*(5), 505-513. doi: 10.1037/hea0000131

Gonzalez, J. S., Kane, N. S., Binko, D. H., Shapira, A., & Hoogendoor, C. J. (2016). Tangled up in blue: Unraveling the links between emotional distress and treatment adherence in type II diabetes. *Diabetes Care, 39*(12), 2182-2189. doi: 10.2337/dc16-1657

Guariguata, L., Whiting, D. R., Hambleton, I., Beagley, J., Linnenkamp, U., & Shaw, J. E. (2014). Global estimates of diabetes prevalence for 2013 and projections for 2035. *Diabetes Research and Clinical Practice*, *103,* 137-149. doi: 10.1016/j.diabres.2013.11.002

Heron, M. (2018). Deaths: Leading causes for 2016. *National Vital Statistics Reports, 67*(6), 1-77.

Ikeda, K., Fujimoto, S., Morling, B., Ayano-Takahara, S., Carroll, A., Harashima S., Uchida, Y., & Inagaki, N. (2014). Social orientation and diabetes-related distress in Japanese and American patients with type II diabetes. *PLoS ONE*, *9*(10), e109323. doi: 10.1371/journal.pone.0109323

Kirkwood, M. (2018). American Diabetes Association releases "Economic costs of diabetes in the U.S." report at annual call to congress event urging legislators to make diabetes a national priority. Retrieved from http://www.diabetes.org/newsroom/press-releases/2018/economic-cost-study-call-to-congress-2018.html

Kitayama, S., Duffy, S., & Uchida, Y. (2006). Self as mode of being. In S. Kitayama & D. Cohen (Eds.). Handbook of culture psychology. New York, NY: Guilford Press.

Lin, J., Thompson, T. J., Cheng, Y. J., Zhuo, X., Zhang, P., Gregg, E., & Rolka, D. (2018). Projection of the future diabetes burden in the United States through 2060. *Population Health Metrics*, *16*(9), 9. doi: 10.1186/s12963-018-0166-4

Lorig, K., Ritter, P., Villa, F., & Armas, J. (2009). Community-based peer-led diabetes self management: Randomized trial. *Diabetes Educator*, *35*(4), 641-651. doi: 10.1177/0145721709335006

Lorig, K., Ritter, P. I., Turner, R. M., English, K., Laurent, D. D. & Greenberg, J. (2016a). Benefits of diabetes self-management for health plan members: A 6-month translation study. *Journal of Medical Internet Research*, *18*(6), e164. doi: 10.2196/jmir.5568

Lorig, K., Ritter, P. I., Turner, R. M., English K., Laurent, D. D. & Greenberg, J. (2016b). Diabetes self-management program: 12-month outcome sustainability from a nonreinforced pragmatic trial. *Journal of Medical Internet Research*, *18*(12), e322. doi: 10.2196/jmir.6484

Mann, C. C., Golden, J. H., Cronk, N. J., Gale, J. K., Hogan, T., & Washington, K. T. (2016). Social workers as behavioral health consultants in the primary care clinic. *Health and Social Work, 41*(3), 196-200.

Mavandadi, S., Wright, E., Klaus, J., & Oslin, D. (2018). Message framing and engagement in specialty mental health care: A follow-up analysis. *Psychiatric Services, 69*(10), 1109-1112. doi: 10.1176/appi.ps.201800056

McBrien, K. A., Naugler, C., Ivers, N., Weaver, R. G., Campbell, D., Desveaux, L., Hemmelgarn, B. R., Edwards, A. L., Saad, N., Nicholas, D., & Manns, B. J. (2017). Barriers to care in patients with diabetes and poor glycemic control – a cross-sectional survey. *PLoS ONE, 12*(5), 1-14. doi: 10.1371/journal.pone.0176135

Narayan, M. (2016). Noncompliant and nonadherent: Time to retire these labels. *Home Healthcare Now, 34*(1), 47. doi: 10.1097/NHH.0000000000000317

Holt, R. I, G., Nicolucci, A., Burns, K., Holt, R. I. G., Lucisano, G., Skovlund, S. E., Forbes, A., Kalra, S., Menendez Torre, E., Munro, N., & Peyrot M. (2016). Research: Educational and psychological aspects correlates of psychological outcomes in people with diabetes: Results from the second Diabetes Attitudes, Wishes and Needs (DAWN2) study. *Diabetic Medicine*, *33*(9), 1174-1183. doi: 10.1111/dme.13109

Odgers-Jewell, K., Ball, L. E., Kelly, J. T., Isenring, E. A., Reidlinger, D. P., & Thomas, R. (2017). Effectiveness of group-based self-management education for individuals with type II diabetes: a systemic review with meta-analyses and meta-regression. *Diabetic Medicine, 34*(8), 1027-1039. doi: 10.1111/dme.13340

Ostlund, A., Wadensten, B., Haggstrom, E., Lindqvist, H., & Kristofferzon, M. (2016). Primary care nurses' communication and its influence on patient talk during motivational interviewing. *Journal of Advanced Nursing, 72*(11), 2844-2856. doi: 10.1111/jan.13052

Ovretveit, J., Mittman, B., Rubenstein, L., & Ganz, D. A. (2017). Using implementation tools to design and conduct quality improvement projects for faster and more effective improvement. *International Journal of Health Care Quality Assurance, 30*(8), 755-768. doi: 10.1108/IJHCQA-01-2017-0019

Pandit. A. U., Bailey, S. C., Curtis, L. M., Seligman, H. K., Davis, T. C., Parker, R. M., Schillinger, D., DeWalt, D., Fleming, D., Mohr, D. C., & Wolf, M. S. (2014). Disease-related distress, self-care and clinical outcomes among low-income patients with diabetes. *Journal of Epidemiology and Community Health*, *68*(6), 557-564. doi: 10.1136/jech-2013-203063

Perrin, N. E., Davies, M. J., Robertson, N., Snoek, F. J., & Khunti, K. (2017). The prevalence of diabetes-specific emotional distress in people with type II diabetes: A systematic review and meta-analysis. *Diabetic Medicine, 34*(11), 1508-1520. doi: 10.1111/dme.13448

Peterson, K. A., Radosevich, D. M., O'Connor, P. J., Nyman. J. A., Prineas, R. J., Smith, S. A., Arneson, T. J., Corbett, V. A., Weinhandl, J. C., Lange, C. J. & Hannan, P. J. (2008). Improving diabetes care in practice: findings from the TRANSLATE trial. *Diabetes Care*, *31*(12), 2238-2243. doi: 10.2337/dc08-2034

Polonsky, W. H., Anderson, B.J., Lohrer, P. A., Welch, G., Jacobson A. M., Aponte, J. E., & Schwartz, C.E. (1995). Assessment of diabetes-related distress. *Diabetes Care*, *18*(6), 754-760.

Polonsky, W. H., Fisher, L., Earles, J., James Dudl, R., Lees, J., Mullan, J., & Jackson, R. (2005). Assessing psychosocial distress in diabetes. Development of the Diabetes Distress Scale. *Diabetes Care*, *28*(3), 626-631. doi: https://doi.org/10.2337/diacare.28.3.626

Ramos, M., McEwan, P., Lamotte, M., & Foos, V. (2017). PRM95-The relationship of predicted benefits in life expectancy and quality adjusted life expectancy for improved glucose control in type II diabetes simulation modeling. *Value in Health, 20*(9), A747-A748. doi: 10.1016/j.jval.2017.08.2081

Roy, T., Lloyd, C. E., Pouwer, F., Holt, R. I., & Sartorius N. (2012). Screening tools used for measuring depression among people with type 1 and type II diabetes: As systematic review. *Diabetes Medicine*, *29*(2), 164-175.

Russell, L. B., Suh, D. C., & Safford, M. A. (2005). Time requirements for diabetes self-management: Too much for many? *Journal of Family Practice, 54*(1), 52-56.

Schmidt, C. B., Potter van Loon, B. J., Vergouwen, A. C. M., Snoek, F. J., & Honig, A. (2018). Systematic review and meta-analysis of psychological interventions in people with diabetes and elevated diabetes-distress. *Diabetic Medicine*, *35*(9), 1157-1172. doi: 10.1111/dme.13709

Schmitt, A., Reimer, A., Kulzer, B., Haak, T., Ehrmann, D., & Hermanns, N. (2016). How to assess diabetes distress: Comparison of the Problem Areas in Diabetes Scale (PAID) and the Diabetes Distress Scale (DDS). *Diabetic Medicine*, *33*(6), 835-843. doi: 10.1111/dme.12887

Schoenthaler, A. M., Schwartz, B. S., Wood, C., & Stewart, W. F. (2012). Patient and physician factors associated with adherence to diabetes medications. *Diabetes Education*, *38*(3), 397-408. doi: 10.1177/0145721712440333

Sessums, L. L., McHugh, S. J., & Rajkumar, R. (2016). Medicare's vision for advanced primary care: New directions for care delivery and payment. *Jama, 315*(24), 2665-2666.

Smith & Parker. (2015). *Nursing theories and nursing practice* (4th ed.). Philadelphia, PA: F. A. Davis Company.

Snoek, F. J., Bremmer, M. A., & Hermanns N. (2015). Constructs of depression and distress in diabetes: Time for an appraisal. *Lancet*, *3*(6), 450-460. doi: 10.1016/S2213-8587(15)00135-7

Stokes, A. & Preston, S. H. (2017). Deaths attributable to diabetes in the United States: Comparison of data sources and estimation approaches. *PLoS ONE*, *12*(1), e170219. doi: 10.1371/journal/pone.0170219

Sweatman, C., Lauerer, J. A., Pruitt, C., & Drayton, S. J. (2016). Major depressive disorder to diabetes-related distress? Screening, evaluation, and treatment in adults with diabetes.

*The Journal for Nurse Practitioners, 13*(3), e117-e123. doi: 10.1016/j.nurpra.2016.08.008

Tanenbaum, M. L., Kane, N. S., Kenowitz, J., & Gonzalez, J. S. (2016). Diabetes distress from the patient's perspective: Qualitative themes and treatment regimen differences among adults type with 2 diabetes. *Journal of Diabetes and Its Complications, 30*, 1060-1068. doi: 10.1016/j.jdiacomp.2016.04.023

Tricco, A. C., Ivers, N.M., Grimshaw, J.M., Moher, D., Turner, L., Galipeau, J., Halperin, I., Vachon, B., Ramsay, T., Manns, B., Tonelli, M., & Shojania, K. (2012). Effectiveness of quality improvement strategies on the management of diabetes: A systematic review and meta-analysis. *Lancet*, *379*(9833), 2252-2261. doi: 10.1016/S0140-6736(12)60480-2

Turner, R. M., Ma, Q., Lorig, K., Greenberg, J., & DeVries, A. R. (2018). Evaluation of a diabetes self-management program: Claims analysis on comorbid illnesses, health care utilization, and cost. *Journal of Medical Internet Research*, *20*(6), e207. doi: 10.2196/mjir.9225

Uher, R., Payne., J. L., Pavlova, B., & Perlis, R. H. (2014). Major Depressive Disorder in DSM-5: Implications for clinical practice and research of changes from DSM-IV. *Depression and Anxiety, 31*(6), 459-471. doi: 10.1002/da.22217

US Burden of Disease Collaborators. (2018). The state of US health, 1990-2016; Burden of diseases, injuries, and risk factors among US states. *Jama, 319*(14), 1444-1472. doi: 10.1001/jama.2018.0158

Van Esch, T. E., Brabers, A. E., Van Dijk, C. E., Gusdorf, L., Groenewegen, P. P., & De Jong, J. D. (2017). Increased cost sharing and changes in noncompliance with specialty referrals in the Netherlands. *Health Policy, 121*(2), 180-188. doi: 10.1016/j.healthpol.2016.12.001

Wagner, E. H., Flinter, M., Hsu, C., Cromp, D., Austin, B. T., Etz, R., Crabtree, B. F., & Ladden, M. D. (2017). Effective team-based primary care: observations from innovative practices. *BMC Family Practice, 18*(1), 13. doi: 10.1186/s12875-017-0590-8

Walker, R. J., Gebregziabher, M., Martin-Harris, B., & Egede, L. E. (2014). Independent effects of socioeconomic and psychological social determinants of health on self-care and outcomes in type II diabetes. *General Hospital Psychiatry*, *36*(6), 662-668. doi: 10.1016/j.genhosppsych.2014.06.011

Ward, K., Eustice, R. S., Nawarskas, A. D., & Resch, N. D. (2018). Comparison of diabetes management by certified diabetes educators via telephone versus mixed modalities of care. *Clinical Diabetes, 36*(1), 44-49. doi: 10.2337/cd17-0018

Wardian, J. & Sun, F. (2014). Factors associated with diabetes-related distress: Implications for diabetes self-management. *Social Work in Health Care*, *53*(4), 364-381. doi: 10.1080/00981389.2014.884038

Weinhold, I. & Gurtner, S. (2014). Understanding shortages of sufficient health care in rural areas. *Health Policy, 118*(2), 201-214. doi: 10.1016/j.healthpol.2014.07.018

Winchester, R. J., Williams, J. S., Wolfman, T. E., & Egede, L. E. (2016). Depressive symptoms, serious psychological distress, diabetes distress and cardiovascular risk factor control in patients with type II diabetes. *Journal of Diabetes Complications*, *30*(2), 312-317. doi: 10.1016/j.jdiacomp.2015.11.010

Zagarins, S. E., Allen N. A., Garb, J. L., & Welch, G. (2012). Improvement in glycemic control following a diabetes education intervention is associated with change in diabetes distress but not change in depressive symptoms. *Journal Behavioral Medicine*, *35*(3), 299-304. doi: 10.1007/s10865-011-9359-z

Zulman, D. M., Rosland, A., Choi, H., Langa, K. M., & Heisler, M. (2012). The influence of diabetes psychosocial attributes and self-management practices on change in diabetes status. *Patient Education and Counseling*, *87*(1), 74-80. doi: 10.1016/j.pec.2011.07.013

## APPENDIX A. EXECUTIVE SUMMARY

Diabetes control, reflected in hemoglobin A1c values, is directly related to patient quality of life and financial status. Nationwide, half of diabetic patients do not meet A1c goals. Evidence points toward increased levels of Diabetes Related Distress (DRD) as a significant contributor to suboptimal diabetes management. Screening and treatment for DRD is recommended by the American Diabetes Association (ADA) using a multidisciplinary approach.

### Project Design

The purpose of this PIP was to implement the Diabetes Distress Scale (DDS) in a rural, primary care setting to identify DRD in patients with type II diabetes at high risk for poor glycemic control (A1c greater than 8%) and treat the condition with pre-existing interdisciplinary staff at the rural clinic to decrease provider time burden and facilitate interdisciplinary care. The project began with education to the clinic staff regarding DRD, ADA recommendations regarding DDS use, and underutilized treatment options currently available at the clinic. During implementation, clinic nurses collected DDS scales and when positive scales were encountered, a referral algorithm was used to determine beneficial interdisciplinary care visits.

### Project Results

A significant increase in referrals to interdisciplinary staff members was observed. Eleven patients complied with referrals to interdisciplinary care visits. Three of these patients completed follow up DDS forms. Diabetes distress scores decreased in one patient and increased in the remaining two. Likewise, of the eleven patients who complied with the appointments, nine had follow up A1c values. Four patients (N=4) had an initial A1c value greater than 8.0%, of which 50% (*n=2*), decreased and 50% (*n=2*) fluctuated above and below 8.0%. The data

revealed that all patients (*N=2*) who reported moderate to high levels of DRD had significant A1c value increases at subsequent visits.

## Recommendations

Use of the DDS scales to detect DRD in patients with type II diabetes was recommended to be continued at the project site based on supporting literature. Although population sizes were too small to make inferences about the data, staff reported that the DDS scales initiated crucial conversations with patients regarding the struggles with their diabetic regimens. In addition, two patients within the project reported moderate to severe levels of DRD. Although A1c values were less than 8% at the time the DRD levels were obtained, these patients experienced increases of 28% and 71% in A1c values at follow up appointments. Research supports that DRD levels forecast future A1c values. Individuals experiencing moderate to severe levels of DRD may benefit from frequent follow up with their healthcare provider to adjust treatment plans. In attempt to increase patient engagement with interdisciplinary team members and their willingness to attend appointments, literature supports flexible scheduling and accommodating interdisciplinary care appointments when the patient is present for another appointment.

## Conclusion

Nationwide, suboptimal diabetes management occurs with 50% of the type II diabetes population. This implies significant need for innovation in healthcare delivery to meet the needs of patients. Patient behaviors, and thus noncompliance, are motivated by unmet needs. Identifying DRD and utilizing interdisciplinary staff members can empower patients with self-care skills and individualize diabetic treatment plans to improve diabetes care.

## APPENDIX B. DIABETES RELATED DISTRESS REFERRAL ALGORITHM

| Elevated subcategory identified by DDS-17 | Appropriate referral for targeted intervention |
|---|---|
| Emotional Burden | Behavioral health therapist and Diabetes Self-Management Program class with RN health coach follow up |
| Physician-related distress | RN health coach and Diabetes Self-Management Program class with RN health coach follow up |
| Regimen-related distress | Dietician and Diabetes Self-Management Program class with RN health coach follow up |
| Interpersonal Distress | Behavioral health therapist and Diabetes Self-Management Program class with RN health coach follow up |

## APPENDIX C. THE DIABETES DISTRESS SCREENING SCALE 2 (DDS2)

DIRECTIONS: Living with diabetes can sometimes be tough. There may be many problems and hassles concerning diabetes and they can vary greatly in severity. Problems may range from minor hassles to major life difficulties. Listed below are 2 potential problem areas that people with diabetes may experience. Consider the degree to which each of the 2 items may have distressed or bothered you DURING THE PAST MONTH and circle the appropriate number.

Please note that we are asking you to indicate the degree to which each item may be bothering you in your life, not whether the item is merely true f or you. If you feel that a particular item is not a bother or a problem for you, you would circle "1". If it is very bothersome to you, you might circle "6".

| | Not a Problem | A Slight Problem | Moderate Problem | Somewhat Serious Problem | A Serious Problem | A Very Serious Problem |
|---|---|---|---|---|---|---|
| 1. Feeling overwhelmed by the demands of living with diabetes. | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. Feeling that I am often failing with my diabetes routine. | 1 | 2 | 3 | 4 | 5 | 6 |

## APPENDIX D. DIABETES DISTRESS SCALE-17 (DDS17)

**DIRECTIONS:** Living with diabetes can sometimes be tough. There may be many problems and hassles concerning diabetes and they can vary greatly in severity. Problems may range from minor hassles to major life difficulties. Listed below are 17 potential problem areas that people with diabetes may experience. Consider the degree to which each of the 17 items may have distressed or bothered you DURING THE PAST MONTH and circle the appropriate number.

Please note that we are asking you to indicate the degree to which each item may be bothering you in your life, NOT whether the item is merely true for you. If you feel that a particular item is not a bother or a problem for you, you would circle "1". If it is very bothersome to you, you might circle "6".

| | **Not a Problem** | **A Slight Problem** | **A Moderate Problem** | **Somewhat Serious Problem** | **A Serious Problem** | **A Very Serious Problem** |
|---|---|---|---|---|---|---|
| 1. Feeling that diabetes is taking up too much of my mental and physical energy every day. | 1 | 2 | 3 | 4 | 5 | 6 |
| 2. Feeling that my doctor doesn't know enough about diabetes and diabetes care. | 1 | 2 | 3 | 4 | 5 | 6 |
| 3. Not feeling confident in my day-to-day ability to manage diabetes. | 1 | 2 | 3 | 4 | 5 | 6 |
| 4. Feeling angry, scared and/or depressed when I think about living with diabetes. | 1 | 2 | 3 | 4 | 5 | 6 |
| 5. Feeling that my doctor doesn't give me clear enough directions on how to manage my diabetes. | 1 | 2 | 3 | 4 | 5 | 6 |
| 6. Feeling that I am not testing my blood sugars frequently enough. | 1 | 2 | 3 | 4 | 5 | 6 |
| 7. Feeling that I will end up with serious long-term complications, no matter what I do. | 1 | 2 | 3 | 4 | 5 | 6 |
| 8. Feeling that I am often failing with my diabetes routine. | 1 | 2 | 3 | 4 | 5 | 6 |
| 9. Feeling that friends or family are not supportive enough of self-care efforts (e.g. planning activities that conflict with my schedule, encouraging me to eat the "wrong" foods). | 1 | 2 | 3 | 4 | 5 | 6 |
| 10. Feeling that diabetes controls my life. | 1 | 2 | 3 | 4 | 5 | 6 |

| | Not a Problem | A Slight Problem | A Moderate Problem | Somewhat Serious Problem | A Serious Problem | A Very Serious Problem |
|---|---|---|---|---|---|---|
| 11. Feeling that my doctor doesn't take my concerns seriously enough. | 1 | 2 | 3 | 4 | 5 | 6 |
| 12. Feeling that I am not sticking closely enough to a good meal plan. | 1 | 2 | 3 | 4 | 5 | 6 |
| 13. Feeling that friends or family don't appreciate how difficult living with diabetes can be. | 1 | 2 | 3 | 4 | 5 | 6 |
| 14. Feeling overwhelmed by the demands of living with diabetes. | 1 | 2 | 3 | 4 | 5 | 6 |
| 15. Feeling that I don't have a doctor who I can see regularly enough about my diabetes. | 1 | 2 | 3 | 4 | 5 | 6 |
| 16. Not feeling motivated to keep up my diabetes self management. | 1 | 2 | 3 | 4 | 5 | 6 |
| 17. Feeling that friends or family don't give me the emotional support that I would like. | 1 | 2 | 3 | 4 | 5 | 6 |

INSTRUCTIONS FOR SCORING:

The DDS17 yields a total diabetes distress score plus 4 subscale scores, each addressing a different kind of distress.[1] To score, simply sum the patient's responses to the appropriate items and divide by the number of items in that scale.

Current research[2] suggests that a mean item score 2.0 – 2.9 should be considered 'moderate distress,' and a mean item score ≥ 3.0 should be considered 'high distress.' Current research also indicates that associations between DDS scores and behavioral management and biological variables (e.g., A1C) occur with DDS scores of ≥ 2.0. Clinicians may consider moderate or high distress worthy of clinical attention, depending on the clinical context.

We also suggest reviewing the patient's responses across all items, regardless of mean item scores. It may be helpful to inquire further or to begin a conversation about any single item scored ≥ 3.

| | | | |
|---|---|---|---|
| Total DDS Score: | a. Sum of 17 item scores. | _____ | |
| | b. Divide by: | 17 | |
| | c. Mean item score: | _____ | |
| | Moderate distress or greater? (mean item score > 2) | yes__ | no__ |
| A. Emotional Burden: | a. Sum of 5 items (1, 4, 7, 10, 14) | _____ | |
| | b. Divide by: | 5 | |
| | c. Mean item score: | _____ | |
| | Moderate distress or greater? (mean item score > 2) | yes__ | no__ |
| B. Physician Distress: | a. Sum of 4 items (2, 5, 11, 15) | _____ | |
| | b. Divide by: | 4 | |
| | c. Mean item score: | _____ | |
| | Moderate distress or greater? (mean item score > 2) | yes__ | no__ |
| C. Regimen Distress: | a. Sum of 5 items (6, 8, 3, 12, 16) | _____ | |
| | b. Divide by: | 5 | |
| | c. Mean item score: | _____ | |
| | Moderate distress or greater? (mean item score > 2) | yes__ | no__ |
| D. Interpersonal Distress: | a. Sum of 3 items (9, 13, 17) | _____ | |
| | b. Divide by: | 3 | |
| | c. Mean item score: | _____ | |
| | Moderate distress or greater? (mean item score > 2) | yes__ | no__ |


1. Polonsky, W.H., Fisher, L., Esarles, J., Dudl, R.J., Lees, J., Mullan, J.T., Jackson, R. (2005). Assessing psychosocial distress in diabetes: Development of the Diabetes Distress Scale. Diabetes Care, 28, 626-631.
2. Fisher, L., Hessler, D.M., Polonsky, W.H., Mullan, J. (2012). When is diabetes distress clinically meaningful? Establishing cut-points for the Diabetes Distress Scale. Diabetes Care, 35, 259-264.

## APPENDIX E. DIABETES DISTRESS SCALE-17 (DDS17)

DRD Fact Sheet:

**Emotional Burden**: Patients feel emotionally overwhelmed by the demands of living with diabetes.
-Referral to BHT and DSMP

1.Feeling that diabetes is taking up too much of my mental and physical energy every day
4.Feeling angry, scared and/or depressed when I think about living with diabetes
7.Feeling that I will end up with serious long-term complications, no matter what I do
10.Feeling that diabetes controls my life
14.Feelinig overwhelmed by the demands of living with diabetes

**Physician-Related Distress**: Patients feel their doctor does not take their concerns seriously enough.
-Referral to DSMP and evaluation by RN health coach

2.Feeling that my doctor doesn't know enough about diabetes and diabetes care
5.Feeling that my doctor doesn't give me clear enough directions on how to manage my diabetes
11.Feeling that my doctor doesn't take my concerns seriously enough
15.Feeling that I don't have a doctor who I can see regularly enough about my diabetes

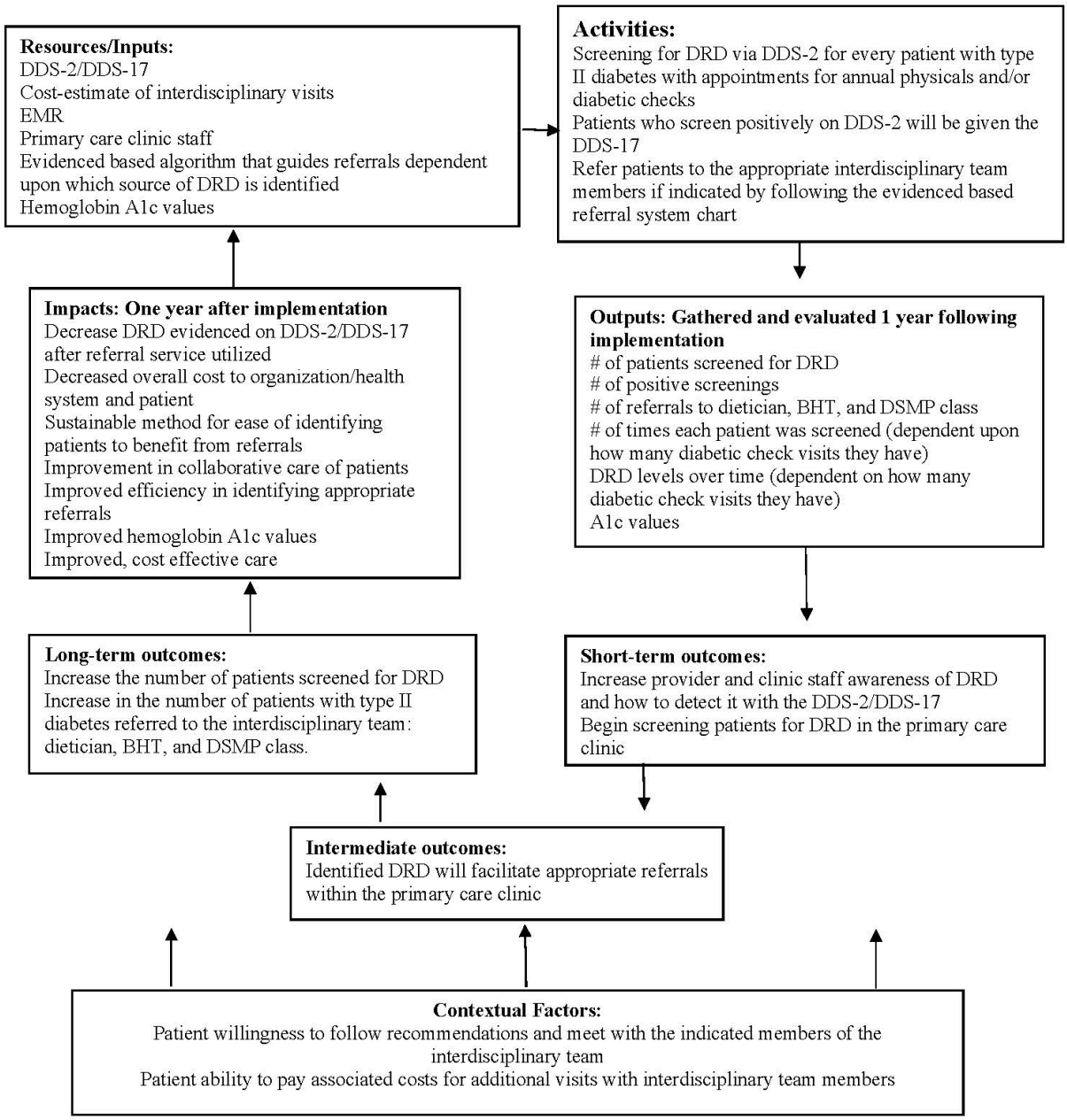
**Regimen Related:** Patients feel they are not sticking closely enough to a good meal plan, exercise regimen, etc.
-Referral to dietician and DSMP

6.Feeling that I am not testing my blood sugars frequently enough
8.Feeling that I am often failing with my diabetes routine
3.Not feeling confident in my day-to-day ability to manage diabetes
12.Feeling that I am not sticking closely enough to a good meal plan
16.Not feeling motivated to keep up my diabetes self-management

**Interpersonal Distress:** Patients feel their friends/family do not appreciate how difficult living with diabetes can be, they do not feel supported by those around them
-Referral to BHT and DSMP

9.Feeling that friends or family are not supportive enough of self-care efforts (ex. Planning activities that conflict with my schedule, encouraging me to eat the "wrong" foods)
13.Feeling that friends or family don't appreciate how difficult living with diabetes can be
17.Feeling that friends or family don't give me the emotional support that I would like

## APPENDIX F. LOGIC MODEL: PLANNING AND EVALUATING STANDARDIZED DRD DETECTION AND TREATMENT AMONG TYPE II DIABETES PATIENTS



## APPENDIX G. PRACTICE IMPROVEMENT PROJECT TIMELINE

*August-December 2018*

1. Expressed interest in implementing a project to improve diabetes outcomes
2. Met with RN health coach to understand how diabetes is managed within the clinic, at that time, the RN health coach expressed interest in being part of a PIP to improve diabetes care for patients and quality measures for the clinic
3. Met with further stakeholders and administration staff to find which resources/needs would be beneficial to the clinic for the diabetes population
4. Topic of DRD was identified by co-investigator as an area of importance in patient care that would also promote better utilization of current clinic resources
5. Bimonthly meetings with the RN health coach established to discuss project rigor and expectations
6. Developed dissertation proposal

*January-February 2019*

1. Finalize dissertation proposal
2. Proposal meeting with NDSU staff
3. NDSU IRB approval sought

*March 2019*

1. Proposal meeting with the healthcare institution
2. IRB approval from the healthcare institution was sought
3. Co-investigator and senior director meeting took place where the senior director agreed that the screening process and referral algorithm should be implemented as normal procedure within the primary care clinic for all patients 18-years-of-age and older with type II diabetes. A letter of support from the senior director was obtained.

*May 2019*

1. Education sessions with providers
2. Education sessions with RN health coach
3. Education sessions with clinic office nurses
4. Education session with reception staff
5. Distribute DDS-2 and DDS-17 forms to RN health coach

*June 2019*

1. Begin administering DDS scales to patients
2. Begin collecting data

*June 2019-July 2020*

1. Data collection period (due to Coronavirus pandemic, data collection was required to cease as of March 1, 2020)
2. Bimonthly meetings with RN health coach to assess for problems and gather suggestions for the project
3. Check in meeting with providers and staff office nurses at three- and six-months following implementation to assess for suggestions or problems with the project

*July 2020*

1. Complete data collection

*July 2020-December 2020*

1. Compile and analyze data
2. Complete dissertation writing

*September 2021*

1. Dissertation defense