The Systematic Utilization of a Depression Screening Tool for Patients with Type 2 Diabetes: A Quality Improvement Project

By Sharon O. Okeke

APPROVED BY:

Dr. Nicole Hall EdD, RN, MSN, MBA, CNE — April 25, 2021
Advisor/Chair — Date

Barbara White, MSN, CRNP — May 5, 2021
Committee Member — Date

Dr. Annette Barnes, DNP, CRNP, FNP-BC, CNE — May 5, 2021
Graduate Program Chair — Date

The Systematic Utilization of a Depression Screening Tool for Patients with Type 2 Diabetes: A Quality Improvement Project

By

Sharon O. Okeke

DNP Project submitted to the School of Nursing
of Salisbury University in partial fulfillment of the requirements
for the degree of
Doctor of Nursing Practice
April 7, 2021

Acknowledgements

I would first like to give thanks to God who gave me the vision and strength to start and complete this journey. I could not have done it without him. A special thanks to my family and the Love of My Life, Cip, for constantly encouraging and motivating me to finish strong. I would like to thank Mrs. Barbara White for being my mentor in the clinical setting. You are so precious to me and I will never forget all you have taught me. Finally, a special thanks to Dr. Nicole for supporting me throughout the whole process. You challenged me in so many ways to be better and I am grateful that I had the opportunity to work alongside you. Thank You!

Abstract

Depression seen in individuals with diabetes mellitus (DM) is associated with DM complications and increased healthcare costs. To mitigate these complications, the American Diabetes Association recommends that providers screen individuals with DM at least annually. However, routine depression screenings are not consistently performed for patients with type 2 diabetes (T2D). The purpose of this Doctor of Nursing Practice project was to implement a quality improvement (QI) project which focused on systematically screening adult patients with T2D in primary care for depression so that depressive symptoms could be identified, treated, and referred earlier. A retrospective chart review was conducted to explore the depression screening frequencies in the pre- and post-implementation periods. The Academic Center for Evidence-Based Practice Star Model was used to organize the implementation of the QI project. The Theory of Planned Behavior was used to assess the provider's willingness to adopt consistent depression screening practices which guided the implementation process. Patients who qualified were meant to be screened with the Beck Depression Inventory-2 tool during their annual wellness visit. The results revealed an increase in depression screenings for adult patients with T2D (n=41) from 15% to 61%. In addition, 30% of participants had positive depressive screening results compared to 0% in the pre-implementation group, and 14% were referred or began antidepressant treatment. These results suggest that the systematic utilization of a depression screening tool by providers in primary care does improve the frequency of depression screening and early identification of depression among individuals with T2D.

Table of Contents

List of Tables

List of Figures

Project Overview

Introduction

Diabetes Mellitus (DM) is a chronic metabolic disease that affects over 34.2 million Americans (American Diabetes Association, 2020). The American Diabetes Association (ADA) identified that psychosocial and emotional disorders are prevalent among people with DM (ADA, 2019). Approximately one in every four individuals with type 1 or type 2 DM have elevated depressive symptoms or depressive disorders (ADA, 2019). Bădescu et al. (2016) suggest that in addition to biological and environmental factors which increase the risk of developing depression for individuals with DM, the psychological burden of managing DM increases the likelihood of developing depression as well. Several research studies contend that patients with DM are roughly two times more likely to develop depression (Bădescu et al., 2016; Joseph et al., 2018). With the increased likelihood of depression among individuals with DM, the ADA recommends routine depression screenings as part of standard DM management (ADA, 2019).

With screening, the ADA recommends that providers screen individuals with DM at least annually, especially when they have a history of depression (ADA, 2019). Additionally, providers should screen individuals with DM for depression when they present with DM complications, demonstrate significant adverse changes in their overall health, or show depressive symptoms (ADA, 2019). Despite recommendations, literature shows variability in the actual frequency of depression screenings (Pfoh et al., 2015; Camacho et al., 2017). Due to inconsistent screenings, depression in the diabetic community often goes undiagnosed (Bădescu et al., 2016; Joseph et al., 2018; ADA,

2019). Depression among individuals with DM is associated with higher healthcare costs, inadequate DM management, poor glycemic control, and DM complications (Bădescu et al., 2016; Barnacle et al., 2016; Choi & Smaldone, 2018; Egede et al., 2016; Kearns et al., 2017; Lin et al., 2017). Due to inconsistent depression screening practices leading to delayed or undiagnosed depression in this population, there are opportunities to implement a systematic approach to ensure routine depression screenings occur (Bădescu et al., 2016). By utilizing a systematic depression screening process, patients can be identified for depression early and begin treatment to optimize their health and wellness.

Primary care is one setting where there are opportunities for implementing routine depression screenings. According to Bajracharya et al. (2016), "primary care settings provide a unique opportunity for the development and implementation of an evidence-based change program to screen and treat those patients with diabetes for depression" (p. 691). Utilizing evidence-based literature to support practice change, such as systematic depression screening, in a primary care setting can contribute to positive health outcomes (Bajracharya et al., 2016). Performing routine depression screenings utilizing a validated and reliable screening tool is an essential component in identifying depression among individuals with DM. Due to its validity, reliability, and readability, the BDI-2 screening tool is one of the most widely used tools to screen for depression in the diabetic population (Rauwerda et al., 2018; Petrak et al., 2015). Evidence-based literature conclusively supports the use of the Beck Depression Inventory-2 (BDI-2) when screening persons with DM for depression (Bădescu et al., 2016; Petrak et al., 2015; Rauwerda et al., 2018).

Problem Statement

Depression seen in individuals with DM is linked to poor glycemic control, increased medication noncompliance, and decreased self-efficacy levels for managing DM (Choi & Smaldone, 2018; Lin et al; 2017). These issues lead to DM complications, increased healthcare expenditures, and overall poor health outcomes and a decreased quality of life (Bădescu et al., 2016; Barnacle et al., 2016; Egede et al., 2016; Kearns et al., 2017). Early diagnosis of depression in the diabetic community is a key component used to improve DM management and prevent DM complications (ADA, 2019). Despite recommendations from the ADA, routine depression screenings may not be consistently performed among individuals with type 2 DM (T2D). Therefore, the systematic utilization of the BDI-2 screening tool during annual wellness visits (AWVs) may be helpful in identifying depression earlier among this population, thereby potentially improving the individual's DM management plan of care.

Purpose of Project

The purpose of this Doctor of Nursing Practice (DNP) project was to implement a quality improvement (QI) project which focused on systematically screening adult patients with T2D in primary care for depression so that depressive symptoms could be identified, treated, and referred earlier. The project achieved this goal by developing and implementing a process for the systematic screening of adults with T2D for depression using the BDI-2 screening tool. In this project, adults with T2D were screened for depression during their AWV. Key accomplishments the researcher achieved consisted of the successful implementation of a depression screening process, the identification of whether this practice change improved the identification of depression, and

recommendations for implementing process changes in a primary care setting through a post-implementation debrief with the provider.

Clinical Question-PICO

The topic of this DNP project was formulated based on the following question: Inadults older than 18 years who do not have Medicare insurance, have type 2 diabetes andare being seen in a primary care clinic, does the systematic utilization of the Beck Depression Inventory-2 tool increase the number of patients identified with and treated for depression symptoms in comparison to current depression screening practices?

Synthesis of Literature

Search Strategies

A literature review was conducted to select and grade current evidence examiningthe use of a systematic screening process for depression, appropriate depression screeningtools for patients with diabetes, and the reliability and validity of the BDI-2 screening tool for patients with T2D when screening for depression. The Cumulative Index of Nursing and Allied Health Literature (CINAHL) Full-Text, Medical Literature Analysis and Retrieval System Online (MEDLINE) with Full Text databases were used to search for articles. Additionally, a hand search was conducted from the references in the articles found within these databases, which identified seven additional articles. These articles were found on Sage Journal and Pubmed.gov. In CINAHL and MEDLINE, keywords used to search for research studies were the following: depression, screening, and AWV. These keywords were joined together by the Boolean phrase “and.” Additional search terms included “depression screening protocol” and “depression screening program”. Research articles were limited to ones published no later than 2015. Including

publications identified during the hand search, the initial total of articles was 154. The articles specific to patients with type 1 diabetes, diabetes complications, postpartum depression, adolescents, children, or those written in a foreign language were excluded. After removing duplicate articles and articles which fell into the exclusion criteria, 60 articles were screened by evaluating the abstracts and full-text content. Research studies primarily conducted in a hospital, acute care setting, or specialty clinic were excluded. Likewise, articles which were irrelevant to the topic or provided limited detail about the research design were excluded as well. The formal literature review and synthesis consisted of 11 articles (See Appendix A & B).

Beck Depression Inventory-2

The use of a validated and reliable screening tool to screen for depression in patients with DM is an essential component of proper DM management (Petrak et al., 2015). Currently several depression screening tools exist in the diabetic population. However, the use of these tools in the diabetic population does not necessarily indicate that the tool is a reliable and valid tool for patients in this community. In a study conducted to examine and compare the appropriateness of the BDI-2 and Well-Being Index (WHO-5) screening tools in participants with diabetes, researchers found the BDI-2 screening tool to be suitable for this population (Rauwerda et al., 2018). While the researchers found that participants preferred to complete the WHO-5 screening tool in comparison to the BDI-2 screening tool because the WHO-5 screening tool had fewer questions, both had high response rates and were likely to be completed by the participant (Rauwerda et al., 2018). The PHQ-9 screening tool is another common depression screening tool used in patients with DM (Janssen et al., 2016). In a separate study when

evaluated for the psychometric properties of the PHQ-9 screening tool, researchers found that the internal consistency of the PHQ-9 screening tool was 0.87, which is lower than the internal consistency of the BDI-2 screening tool (Janssen et al., 2016; Jackson-Koku, 2016). The BDI-2 screening tool is both commonly used and found to be suitable for the diabetic population (Bădescu et al., 2016; Rauwerda et al., 2018). It has a construct validity of 0.93 and an internal consistency of 0.91 (Jackson-Koku, 2016). Due to theevidence found in these articles, it was concluded that the use of the BDI-2 tool is appropriate when screening patients with DM for depression. Therefore, the BDI-2 screening tool was used in this project to screen participants with T2D for depression.

Depression Screening Frequency

Several studies reviewed assessed the systematic process of screening participants for depression. Three research studies reviewed implemented depression screening on an annual basis (Henry et al., 2019; Hernández-Jiménez et al., 2019; Loeb et al., 2015). Henry et al. (2019) found that after implementing annual depression screenings, depression screenings increased from 29% to 64%, and of those screened, 20% screenedpositive for depression. Hernández-Jiménez et al (2019) reported that due to the diabetesprogram in place which included diabetes education and annual depression screenings, patients felt empowered to manage their chronic illness. Therefore, fewer patients were identified as depressed by the end of the program (Hernández-Jiménez et al., 2019). Loeb et al. (2015) identified that annual depression screenings and staff education increased depression screening documentation in the clinic's electronic health record (EHR). Other articles such as Jin and Wu (2019) and Bajracharya et al. (2016) outline screening participants in intervals different from annually. For example, Jin and Wu (2019) screened participants

for depression during their initial visit and every three months. Due to the frequent depression screening, they concluded that participants at riskwere identified earlier on for depression (Jin & Wu, 2019). Bajracharya et al. (2016) planned to screen participants at every visit. They found that 85% of their population was screened for depression, and of those screened, 24.6 % screened positive for depression(Bajracharya et al., 2016).

Similar to the notion of annual depression screenings, four articles implemented depression screenings during the participant's AWV (Camacho et al., 2017; Sundeen et al., 2020; Tao, 2017; Pfoh et al., 2015). Camacho et al. (2017), Sundeen et al. (2020), and Tao (2017) identified that participants who were screened during their AWV were more likely to be screened for depression than those who were not. Contrary to these studies, Pfoh et al. (2015) found that participants were more likely to be screened for depression at times other than their AWV. In this study, 15% of participants were screened for depression during non-AWVs versus the 10% of participants during their AWV (Pfoh et al., 2015). Although, there was some variability in depression screening practices, most studies support the notion that depression screening should occur at least annually and that AWVs is a suitable time to do so.

Variations in Concept Definition of Population

Throughout the review of literature, variations existed between concept definitions and populations. For instance, in three articles, the population of focus were specific to participants with T2D (Janssen et al., 2016; Rauwerda et al., 2018; Bajracharya et al., 2016). However, in eight articles the population of focus consisted of adults older than 18 years with a mixture of chronic illnesses including DM (Camacho etal., 2017; Henry et al., 2019; Loeb et al., 2015; Hernández-Jiménez et al., 2019; Jin & Wu, 2019; Pfoh et al.,

2015; Sundeen et al., 2020; Tao, 2017). In the studies where the population of focus was specific to participants with T2D, the length of time the participant was required to have been diagnosed with T2D was not specified.

Additionally, the operational definition of depression varied depending on the depression screening tool used. Several studies used the PHQ-9 screening tool to screen patients for depression (Bajracharya et al., 2016; Janssen et al., 2016; Henry et al., 2019; Loeb et al., 2015; Jin & Wu, 2019; Pfoh et al., 2015; Sundeen et al., 2020; Tao, 2017). In these studies, participant screenings were positive for depressive symptoms if their total score was nine or greater. In the articles which utilized the BDI-2 screening tool, participant screenings were positive for depressive symptoms if the total score was greater than 14 (Petrak et al., 2015; Rauwerda et al., 2018). Finally, in other studies, the depression screening tool was not identified or the score threshold for positive depressive symptoms was not identified (Hernández-Jiménez et al., 2019; Camacho et al., 2017). Therefore, the literature review found that an operational definition of depression was not clearly identified or consistently utilized. Based on the findings from the literature analysis, this DNP project used the BDI-2 screening tool total score of 14 or greater to identify participants with a positive depressive symptom screening.

Variations in Methods and Quality

The majority of the research articles analyzed had a moderate to large sample size, identified an effect size, clearly described the methodology and procedure of the study, and provided fairly definitive conclusions. For instance, Henry et al. (2019), Hernández-Jiménez et al. (2019), Jin and Wu (2019), Tao (2017), Pfoh et al. (2015), Camacho et al. (2017), and Janssen et al. (2016) each had studies that consisted of more than 1000

participants. Furthermore, all studies used a validated depression screening tool that had a high internal consistency. It is important for the researcher to use validatedand reliable instruments to measure variables, because it helps the researcher know that the tool is measuring what it is intended to measure, thereby improving the quality of the study (Polit & Beck, 2017). Finally, all of the research studies were either random controltrials or quasi-experiments. Therefore, all articles' strengths of evidence were level II or III articles with a quality level of A or B. Research studies within these categories indicate that the results and conclusions of the study are consistent with current literature and are well organized (Melnyk & Fineout-Overholt, 2015). Thus, these studies are considered rigorous and can be replicated by others.

Literature Review Summary

In conclusion, based on the literature review conducted, three key recommendations are suggested. First, the BDI-2 screening tool is an appropriate depression screening tool for patients with DM. The BDI-2 screening tool's internal consistency and construct validity indicates that it is a valid and reliable instrument fordepression screenings. Second, depression screenings should occur at least annually. Although there were some variations in the frequency of depression screenings, most of the articles supported annual depression screenings. Finally, the research studies suggest that it can be beneficial for depression screenings to take place during the patient's AWV.Through this literature synthesis, the articles suggest that by implementing these key recommendations, patients can be diagnosed with depression earlier which may result in improved DM management.

Theoretical Framework and Evidence-Based Practice (EBP) Model

To routinely screen adults with T2D for depression, healthcare providers must recognize the importance of routine depression screening within the diabetic population. In doing so, providers may be more willing to change their current depression screening practices. The theoretical framework and evidence-based practice (EBP) model used to guide the implementation of this DNP project in a primary care setting are the Theory of Planned Behavior (TPB) and the Academic Center for Evidence-Based Practice (ACE) Star Model.

Theoretical Definitions

The TPB is a theoretical framework that supports the notion that motivation and behavioral intent influence the ability and likelihood that a behavior will change (LaMorte, 2019). The TPB is comprised of six constructs that collectively influence a person's ability to change a behavior (LaMorte, 2019). The constructs which make up the TPB theory are attitude, behavioral intent, subjective norms, social norms, perceived power, and perceived control.

Attitude is defined as "the degree to which a person has a favorable or unfavorable evaluation of the behavior of interest" (LaMorte, 2019, p.1). Behavioral intention refers to the factors which encourage a specific behavior (LaMorte, 2019). Subjective norms refer to whether peers and other important figures approve of a specificbehavior (LaMorte, 2019). Social norms are defined as those behaviors considered normal or standard (LaMorte, 2019). Perceived power refers to the presence of factors that can affect the influence of behavioral changes (LaMorte, 2019). Finally, perceived

control is related to whether the individual perceives they have the ability to control behavioral changes (LaMorte, 2019).

The TPB was utilized in this DNP project because the provider's attitude, behavioral intention, peers and social norms, and the perception of power and control all could potentially influence health promotion screening practices (Polit & Beck, 2017). In this DNP project, the application of the TPB's constructs allowed the researcher to identify factors that affected the provider's behavior towards current and proposed depression screening practices. With this knowledge, the researcher and provider were able to develop strategies that helped mitigate these factors so a systematic depression screening process could be successfully implemented.

Based on the TPB constructs, the providers attitude was favorable towards implementing a systematic depression screening process and utilizing an EBP depression screening tool. The provider was also able to recognize the negative implications of depression in the diabetic community. The ability to recognize the importance of depression screening impacted the providers behavioral intent. However, several factors existed which influenced the provider's current depression screening practices which consisted of screening patients for depression when they physically presented or reported depressive symptoms during a physical assessment using an outdated depression screening tool. To begin with, the primary care physician and psychoanalyst affiliated with the primary care clinic did not implement routine depression screenings for patients they saw. The primary care physician and psychoanalyst are subjective norms which influenced the providers behaviors. Due to the provider's peers, the provider utilized a

depression screening practice which appeared convenient, practical and aligned with peer behaviors. Additionally, the provider was unaware of the ADA recommendation of providing routine depression screening for patients with diabetes. The ADA is a governing association which helps identify EBP standardized diabetes management (ADA, 2019). In this DNP project, the ADA is the social norm which influences the providers screening practices. In relation to perceived power, factors such as limited staff, time, and office supplies influenced the providers belief that changing depression screening practices were possible. Due to limited staff and the increased number of patients seen in the clinic, the provider's workload was heavy. So, implementing routine depression screenings for patients with diabetes increased her workload further and decreased her ability to offer additional time to screen patients for depression. Moreover, since the facility was small, it had limited resources for office supplies like printing paper for making copies of the depression screening tool available. Lastly, within the provider's perception of control was the belief that changing depression screening practices to align with the ADA recommendation and EBP literature was possible. In closing, with the TPB, factors and perceptions were identified which influenced the provider's depression screening practice for patients with diabetes. Based on these factors and perceptions, strategies were created prior to and throughout the implementation process to identify, address and mitigate these issues.

Operational Definitions

The operational definition identified for this DNP project was depression. Using the BDI-2 screening tool, a positive screen for depressive symptoms for adults with T2D

is a score equal to or greater than 14 (Petrak et al., 2015). For the purpose of this project, the term systematic was defined as depression screenings which took place during the patient's AWV (Camacho et al., 2017; Sundeen et al., 2020; Tao, 2017; Pfoh et al., 2015).

Evidence-Based Practice Model

The Academic Center for Evidence-Based Practice (ACE) Star Model was used to facilitate the implementation of this quality improvement (QI) project in an organized manner. The ACE Star Model is comprised of five stages that systematically guide the integration of EBP into clinical practice (Melnyk & Fineout-Overholt, 2015). The five stages are discovery, evidence summary, translation, practice integration, and evaluation. In the discovery stage, scientific inquiry drives the researcher to review current literature to uncover new information about the topic of focus (Melnyk & Fineout-Overholt, 2015). In the second stage, evidence summary, the researcher synthesizes the literature to provide evidence that supports practice changes (Melnyk & Fineout-Overholt, 2015). During the translation stage, the researcher takes the EBP literature recommendations and translates the knowledge into clinical pathways, protocols, care standards, or algorithms that allow others to quickly identify best practices (Melnyk & Fineout-Overholt, 2015). The fourth stage, practice integration, involves changes to practice through formal and informal strategies (Melnyk & Fineout-Overholt, 2015). Finally, in the evaluation stage, the researcher evaluates the impact the EBP change has on outcomes (Melnyk & Fineout-Overholt, 2015).

The ACE Star Model was used in this QI project because it helped the researcher utilize a succinct and systematic format to examine, analyze, implement, and evaluate current EBP literature recommendations into the clinical setting. The ACE Star model suggested that the researcher identify a problem in the clinical setting which had clinical significance to the population of focus. Based on the problem identified, the researcher searched and analyzed current evidence-based literature and recommendations from governing associations to determine best practice for depression screening in the diabetic population. The literature review was then translated into depression screening guidelines which the primary care setting could implement. The ACE Star Model then required the researcher to examine factors which would affect the integration of the practice change and prevent sustainability. Here, the researcher assessed factors which influenced the provider's depression screening practices utilizing the TPB. Finally, the researcher evaluated the implementation of the QI project by performing process evaluations and examining health outcomes. In conclusion, through the use of the ACE Star Model, this QI project was able to identify, implement, and evaluate a practice change related to improving the management of DM using a systematic depression screening process.

Project Design

Methodology

This DNP project is a QI project based on current EBP literature. It utilized the TPB theoretical framework and the ACE Star model to guide the implementation process.The TPB theoretical framework was used to assess for the provider's perceived ability to change depression screening practices, and the ACE Star model was used to organize the project's implementation.

The researcher used a retrospective chart review to examine depression screening frequencies during the pre and post implementation periods. Data was collected by performing a chart review which compared the frequency of depression screenings during the defined pre-implementation and post-implementation data collection periods. Before the QI project was initiated, Salisbury University's (SU's) Institutional Review Board (IRB) approval was received (See Appendix C). In addition, an IRB amendment was approved to include the involvement of the provider's nurse practitioner (NP) students in the QI project (See Appendix D).

Setting

The collaborating facility associated with this project is a small primary care office in Maryland (See Appendix E). It is owned and managed by one NP. Additional staff members consist of one secretary and at times one to three NP students. The NP students are rotated throughout the year and are typically available in the clinic during the fall, winter and spring academic semesters. The collaborating facility treats patients with both acute and chronic illnesses. Each year, the provider sees roughly 1,500 patients older than 18 years of age.

Participants

Participants in this study were selected using convenience sampling as all patients seen during specified time frames had the potential to be included. All patients with T2Dwho were scheduled for an AWV during the months of September 1, 2019 to December 31, 2019 when baseline data was collected and September 1, 2020 to December 31, 2020when implementation data was collected, were potentially included as participants in the QI project. However, only patients who were English-speaking adults

older than 18 years with T2D were included in the project. In addition, adults with T2D who utilized Medicare were excluded from the study since annual depression screenings are a requirement for this population. Lastly, participants with an existing diagnosis of depression were excluded from the QI project as well since they already received depression screenings at least annually.

Tool

The BDI-2 tool was approved for use in this DNP project (See Appendix F). It is commonly used to screen for depression in patients with DM (Bădescu et al., 2016). It is a 21- item multiple-choice, self-reporting depression screening tool which has copyright restrictions. Therefore, the tool itself cannot be included in this QI project paper. The BDI-2 screening tool has a construct validity of 0.93 and an internal consistency of 0.91 (Jackson-Koku, 2016). Additionally, it has a sensitivity of 81% and a specificity of 92% (American Psychological Association, n.d.). This screening tool has a sixth-grade reading level and takes approximately ten minutes to complete (American Psychological Association, n.d.). The BDI-2 screening tool assesses for depressive symptoms like sadness, anhedonia, fatigue, and suicidal thoughts. Each of the 21 questions are rated between 0 and 3, and the maximum score an individual can obtain is 63. A total score between 0 and 13 indicates minimal depression symptoms, while an overall score of 14 or higher is considered a positive screen and indicates that the patient likely has depression and requires additional follow-up. According to the BDI-2 tool, a total score from 14 to 19 indicates depressive symptoms that are mild. A person with a depression screening tool total score from 20 to 28 indicates moderate depressive symptoms, while a total score equal to or greater than 29 indicates the patient has symptoms of severe

depression.

Interventions

The goal of this DNP project was to systematically screen adults with T2D for depression. All patients with T2D were meant to be screened for depression during their AWV using the BDI-2 screening tool to accomplish this goal. Key interventions used to implement this QI project consisted of developing a systematic depression screening process; providing staff with 30-minute educational sessions; meeting frequently with the clinic's staff to discuss barriers during the implementations process; displaying depression screening reminder messages through computer screensavers; posting "change of practice flyers" in the waiting room and staff office.

The primary intervention used in this QI project was the implementation of a systematic process for screening patients with T2D for depression during their AWV. The standardized procedure began with the secretary printing a list of all of the patients scheduled for an appointment that day. The NP then reviewed the patients' list and identified those scheduled for an AWV who are diagnosed with T2D by reviewing each patient's electronic health record (EHR). Once the patient was identified, the NP highlighted the patient's name to signify that the patient needed to receive a BDI-2 screening tool upon arrival. The patient completed the depression screening tool in the waiting area. If the patient felt uncomfortable completing the tool in a public area, the patient was offered the option to complete the tool in an empty examination room which provided some privacy. After the patient completed the tool, the secretary calculated the total score and scanned the tool into the patient's EHR. The completed BDI-2 screening tool was then reviewed by the NP or NP student with the patient to share the results and

to determine whether follow-up treatment was needed. To reinforce the education verbally provided to the patient, a standardized educational handout was meant to be provided to the patient while the NP or NP student reviewed the screening tool results (See Appendix G).

Before the QI project was implemented, the researcher sought to obtain buy-in from the clinic's staff. To obtain buy-in, the researcher collaborated with the NP to understand the clinic's current depression screening process and workflows. Based on this information and the researcher's literature review, the researcher then held 30-minute sessions with the secretary, NP, and NP students, which discussed the importance of their role in the QI project and of screening patients with T2D for depression, as well as the differences between the former depression screening tool and new depression screening tool. The NP and NP students received additional information about interpreting results and reviewing the tool with the patient. Initially, NP students were not included in the QI project. So, they did not receive their QI project educational session until several weeks after the NP. This is because the researcher was unaware of their presence in the clinic when the NP and the researcher discussed the QI project. An addendum was submitted to SU's IRB, which then allowed NP students to participate in the project. Once approved, the NP students received the 30-minute educational session to gain their support, which consisted of the same information shared with the NP. Furthermore, to encourage and maintain buy-in from staff members, weekly meetings were held in the month of September. Bi-weekly meetings were held with staff members from October to December. The purpose of these meetings was to identify, discuss, and address any challenges or facilitating factors noted while implementing the QI project. During these

meetings, the NP, NP students, secretary, and researcher discussed the challenges noticed in the implementation process as well as developed strategies to overcome these issues. These methods, such as collaborating with the NP and holding QI project educational sessions and staff meetings, were instrumental in obtaining buy-in for this QI project. These interventions helped build rapport between the staff members and researcher and encouraged staff members to participate in the change process.

Additional key interventions used to implement this QI project consisted of notifications and reminders to patients and staff members related to the change in depression screening practice for patients with T2D. Several weeks before the QI project was implemented, patients were sent an email informing them of the change in depression screening practice for patients with T2D. Staff members and patients were both reminded of this change in practice with flyers posted in the waiting room area and staff office (See Appendix H). These flyers included information about the change of practice, when it was scheduled to begin, and why the practice change occurred. A screensaver displayed on the NP and secretary's computers was developed to remind them to screen patients with T2D for depression. The screensaver showed the following message, "Please screen all patients with diabetes for depression during their annual physical". The notifications and reminders were important interventions used to implement this QI project because they informed and educated the patients about the change of practice.

Data Collection Procedures

The researcher was responsible for all data collected. Data collection began August 10, 2020 and ended January 1, 2021. The researcher collected data electronically

by reviewing the EHR for each participant. Baseline data consisted of the participants who met this project's criteria and were seen between September 1, 2019 and December 31, 2019. The post-implementation data was collected on patients who met this project's criteria and were seen between September 1, 2020 to December 31, 2020. In the post-implementation period, participants were identified by the NP highlighting the names of the patients located on the daily patient schedule printed by the secretary.

The demographic data collected for this DNP project consisted of the age and gender of the participants. Additional data collected consisted of whether the participant was screened for depression during their AWV, and whether the depression screening cumulative score indicated the patient likely had depression. Since one of the interventions of this DNP project consisted of introducing a new depression screening tool to the clinic, two depression screening scores were collected. For baseline data purposes, a cumulative depression screening score equal to or greater than 17 indicated the participant likely had depression and needed further follow-up. While in the post implementation phase, a depression screening score of 14 or higher indicated the participant likely had depression and needed further follow-up. Baseline and post implementation data were documented in two separate spreadsheets individualized to their data and the tool being utilized (See Appendix I and Appendix J).

To preserve the confidentiality and anonymity of the participants' information, several interventions were implemented. First, the BDI-2 screening tools, baseline data spreadsheets, and post-implementation data spreadsheets did not contain patient-specific identifiers. Second, the daily patient schedule lists which did contain the participants' names were located in a manilla envelope on the secretary's desks which only the clinic's

staff had access to. The daily patient schedule lists were shredded approximately every two weeks. Finally, all data collected was stored in a password encrypted file in SPSS and on the researcher's laptop.

Strength, Weakness, Opportunity, and Threat (SWOT) Analysis

A strength, weakness, opportunity, and threat (SWOT) analysis was conducted before the QI project was implemented so that the researcher could understand factors that may have supported or hindered the DNP project from being successfully implemented in the collaborating agency (See Appendix K). The strengths of implementing a QI project in this collaborating facility consisted of the staff being supportive of QI projects and the facility having a moderate size diabetic population. In the collaborating facility, the NP encourages her NP students to participate in QI and EBP projects so they are better aware of and can implement current EBP into their everyday practice. Furthermore, the facility's staff demonstrated they were supportive of QI projects by their willingness to meet with the researcher throughout the implementation process to discuss barriers, facilitators, and methods to improve the QI project. Additionally, the diabetic population seeking care at the collaborating facility is a strength because this QI project focused on adults with T2D. By having a moderate sample size population available, the researcher gained further insight into this topic's clinical significance among people in the diabetic community.

The weaknesses of implementing a QI project in the collaborating facility were that the collaborating facility had limited resources and EHR operating capabilities, and the facility lacked a standardized protocol for screening patients with T2D for depression. The collaborating facility is also small and can only see two patients at a time so

resources like staff and finances were limited. In addition, the EHR demonstrated it had restricted operating capabilities because the clinic's medical record system did not allow the BDI-2 screening tool to be added. Bajracharya et al. (2016) reports that an electronic depression screening tool may help facilitate a standardized depression screening process because it could improve the clinic's staff workflow for documenting depression screenings. Also, an electronic depression screening tool may allow the clinic's staff to receive reminders when the patient is due to be screened for depression. Finally, the lack of a standardized depression screening protocol is a weakness because it becomes more challenging to design and establish a standardized process in the facility.

The threats of implementing a QI project in the collaborating facility were related to the timing the project took place in and the clinic's location. To begin with, the QI project took place during the COVID-19 pandemic. Due to the pandemic, the volume of patients who physically visited the clinic decreased in comparison to numbers pre-pandemic. In addition, the collaborating facility is located near several larger primary care clinics. So, patients may have sought treatment at one of the larger facilities instead of from this primary care practice. It is important to recognize these two threats because both could impact the sample size of the project.

Lastly, the opportunities of implementing a QI project in the collaborating facility consisted of the provider potentially improving how T2D is managed and the provider improving the patient's understanding of how depression can affect T2D management. Literature studies showed that depression could negatively impact DM management (Bădescu et al., 2016; Choi & Smaldone, 2018; Egede et al., 2016; Lin et al., 2017). Therefore, identifying depression early in this population has led to better health

outcomes (Bădescu et al., 2016; Choi & Smaldone, 2018; Egede et al., 2016; Lin et al., 2017).

Timeline

This DNP project was approved by the collaborating facility in November 2019. By June 9, 2020 an IRB application was submitted to SU's IRB, and on July 31, 2020 the project was approved for an implementation period from August 1, 2020 through May 31, 2021. During the months of August and September, the researcher met with the collaborating facility's NP, NP students, and secretary to provide 30-minute educational sessions.

Also, in the month of August, the researcher began to collect baseline data. From September to December, the researcher and collaborating facility's staff implemented a systematic depression screening process for patients with T2D. The systematic depression screening process consisted of ongoing assessment and evaluation of the depression screening process along with data collection. During the months of September, October, and December, the researcher held routine meetings with the collaborating facility's staff. In these meetings, the researcher and collaborating facility's staff discussed the challenges observed while implementing this QI project. Initially, the researcher met with the facility's staff weekly. This was conducted in order to obtain buy-in from staff. After a month, the researcher moved to bi-weekly meetings with the collaborating facility's staff in order to assess the implementation process with the collaborating facilities staff. On December 31, 2020, the QI project implementation phase concluded, and the data analysis phase began. The researcher conducted data analysis in January 2021. Afterwards, the researcher held a post-implementation debrief

with the collaborating facility's staff to discuss the results of the QI project and strategies for sustainability. A concise timeline of project planning, events, and meetings can be found in Appendix L.

Letters of Approval

Approval was granted by both the collaborating agency and SU prior to the project's implementation. Before approval was granted by SU, a presentation was provided to this DNP QI project's faculty chair and program chair which outlined the goals and aim of this project. After multiple revisions, the final IRB application was approved July 31, 2020 and an addendum was approved September 9, 2020.

Project Implementation

After obtaining approval from SU's IRB, the researcher was able to begin the implementation of this DNP QI project in the collaborating facility. On August 10, 2020, baseline data was collected over a two-week period on patients seen in the clinic from September 1, 2019 to December 31, 2019. During this period, flyers were posted throughout the waiting room area, and emails were sent to patients to notify potential participants of the upcoming practice change and identify the purpose of this QI project. On August 13, 2020 the researcher held 30-minute educational sessions with the NP and secretary to review the BDI-2 screening tool and discuss the importance of systematic depression screening practices. After an addendum made to the original IRB application was approved which incorporated NP students as part of the project, an additional 30-minute educational session was held to educate these students on the systematic process used in this project to screen patients with T2D for depression. This educational session was held on September 24, 2020.

The implementation of the systematic depression screening process using the BDI-2 screening tool began September 1, 2020. The researcher met with their DNP QI project faculty chair each month to discuss challenges and barriers associated with the project. Additionally, the researcher and faculty chair discussed how to perform ongoing process evaluations and how to implement a sustainable QI project. Moreover, the researcher met with the collaborating facility's staff on September 1st, 10th, 17th and 24th to discuss challenges and barriers associated with implementing this QI project. During these meetings the researcher and staff members developed strategies which helped mitigate challenges identified. Similar to the meetings held in September with the collaborating facility's staff, in October to December, the researcher held bi-weekly meetings with the collaborating facilities staff members to discuss opportunities for improvement with the depression screening process.

Due to the ongoing process evaluations, the researcher implemented strategies identified during these meetings to improve the QI procedure compliance for depression screening. To begin with, educational handouts were not consistently provided to patients, and the BDI-2 tools were not consistently reviewed with the patient. In order to improve compliance to the procedure outlined, the researcher began to paper clip the handout directly to the depression screening tool. The researcher and staff also identified that completed BDI-2 tools were not consistently scanned into the participant's EHR, and the tool was not shredded within one week after being placed in the bin designated for shredding. To overcome these issues, the researcher counselled the staff on the QI procedure and collaborated with the secretary to designate one day each week to shredding the BDI-2 tools. Finally, due to staffing issues and high patient workloads,

participants were not consistently screened for depression. To reduce the workload, the researcher began to volunteer in the collaborating facility approximately twice per week during the month of October, November and December.

Throughout the implementation of the QI project, the researcher reinforced with the collaborating facility's staff members the importance of consistently screening patients with T2D for depression using the BDI-2 screening tool because of the health consequences associated. Furthermore, the researcher reminded staff that it was important to follow the systematic process outlined for this QI project because it allowed the researcher to perform process evaluations and reinforced the project's rigor. The implementation period was concluded December 31, 2020. On January 26, 2021, the researcher met with the collaborating facility NP to review the results of the QI project and discuss the sustainability of this QI project.

Barriers

Several barriers existed during the implementation of this QI project which were related to the weaknesses of implementing this QI project in the collaborating facility. The barriers observed during the implementation process consisted of financial limitations and issues complying to the QI project procedures. In regard to financial constraints, the BDI-2 screening tool had to be purchased in order to use it since it had copyright privileges. Throughout the implementation process, the researcher purchased the tool. Although the BDI-2 screening tool had an associated cost, it was used in this QI project because of its validity and reliability, EBP recommendations, and provider preference. To facilitate sustainability related to the use of the BDI-2 tool in the depression screening process in the collaborating facility, the researcher reviewed the

benefits and financial implications of using the BDI-2 screening tool early with the NP. However, due to budget constraints, the NP ultimately decided to discontinue the use of the BDI-2 screening tool after the QI project ended.

A lack of consistent compliance to the procedures outlined by the researcher was another barrier identified during the implementation period. This barrier is related to the facility's weakness of limited resources identified during the SWOT analysis. In relation to limited resources, the collaborating facility had a limited number of staff members available to see patients. During the implementation process, there was an increased number of patients seen in the facility. This could have occurred due to patients missing appointments earlier in the year due to COVID-19. So, patients were trying to see their provider before the year ended. However, to comply with state regulations, the collaborating facility could only have a limited number of staff and patients in the facility at any given time. Therefore, only two staff members were available to see patients.

Since there was an increase in patient volume and a decrease in staff available, the workload for the NP, NP students, and secretary increased which affected the time the staff members could dedicate to the systematic depression screening process. To overcome this barrier, the researcher volunteered approximately two times each week during the months of October to December.

Moreover, compliance to the procedures outlined by the researcher was also related to the facility previously not having a protocol in place which screened adults with T2D for depression. Since the procedure outlined by the researcher was a new process for the collaborating facility's staff members to follow, the staff members had to change their screening behaviors and practices in order to comply with the newly

designed systematic process. According to Straatmann et al. (2018), change in health organizations cannot exist without healthcare leaders assessing their staff's willingness to change and addressing barriers which hinder change. Applying the TPB, the researcher identified that by addressing factors which prevented staff members from changing their depression screening practices and complying to the new procedure, staff members were more willing to accept the change in practice. For instance, depression screening tools were not consistently scanned into the participant's electronic health record (EHR) immediately after the participant completed the tool or shredded within one week as outlined in the approved IRB application and agreed upon in advance with the facility. To address this issue the researcher re-educated the facility's staff about the QI procedure and the importance of maintaining patient privacy. Also, the researcher collaborated with the secretary to designate a specific day each week to shred BDI-2 tools. Another issue observed was that educational handouts were not consistently reviewed with the participant after the participant completed the tool. To overcome this issue, the researcher began to attach the educational handout directly to the BDI-2 screening tool for convenient access. It was important for the researcher to address these barriers and develop strategies that prevented staff members from deviating from the QI procedure identified because it could impact the project's quality and sustainability (Polit & Beck, 2017).

Facilitators

Support from the collaborating facility's staff members helped to facilitate the successful implementation of this QI project. It was also a key strength identified early on in the planning stage during the SWOT analysis. The NP demonstrated she supported the

QI project when she allowed the researcher to access the patient's EHR. The ability for the researcher to access patient's EHR was crucial in this QI project because it was the platform used to collect data from the pre- and post-implementations periods.

Additionally, the clinic's staff showed they supported this QI project because they willingly agreed to meet with the researcher often to discuss the challenges, barriers, and facilitating factors which impacted the QI project. In the first month of implementing this QI project, the researcher met with the clinic's staff weekly. However, during the remainder of the implementation period, the researcher met with the clinic's staff bi-weekly. Since the clinic's staff was supportive and engaged throughout the process, the researcherwas able to maintain buy-in during the implementation period.

Summative Evaluation of Implementation

The evaluation of the implementation period was based on the post-implementation debrief held at the end of the QI project and an analysis of the data collected. During the post-implementation debrief, the researcher and clinic staff discussed what went well and did not go well during the implementation phase, possible considerations for the future, and the results of the QI project. From this de-brief, the researcher found that she was able to successfully translate EBP into the clinical setting and that the 30-minute educational sessions were helpful in educating staff about DM and the importance of recognizing depression early in this community.

In order to translate EBP in the clinical setting, the researcher created depression screening guidelines after analyzing literature for EBP recommendations related to depression screening practices. The researcher found several articles that provided evidence that supported annual depression screenings and the use of the BDI-2 screening

tool for adult patients with T2D. Using the EBP ACE Star Model, the researcher evaluated the EBP literature recommendations and systematically analyzed, implemented, and evaluated the practice change into the clinical setting. During the de-brief, the clinic's staff reported that the process translated from EBP literature had been effective and it was feasible to continue implementing this process into their practice. Additionally, the NP expressed a desire to expand the systematic depression screening process to include all patients with chronic illnesses.

During the post-implementation de-brief, the clinic's staff discussed the 30-minute educational sessions. The goals of the educational sessions were to educate the staff about depression and diabetes and the QI project procedures as well as identify what their role was in the QI project. The 30-minute education sessions were deemed successful because 100% of the staff attended, and staff verbalized that the session helped to highlight the importance of depression screening in the diabetic community.

With evaluating the overall success of this project, it was important to look at whether there was an increase in depression screenings performed and/or patients identified as experiencing depressive symptoms. In this regard, the implementation of this QI project was determined to be successful because the researcher found that after the systematic depression screening process was implemented there was an increase in the number of patients screened and identified as having depressive symptoms. Also of interest, is that anecdotally, the NP and NP students reported that the systematic screening process helped to identify patients with depression which would have been missed using the previous depression screening process since the patient did not physically or verbalize depressive symptoms.

Lastly, the implementation process was evaluated by whether patients experienced the risks associated with participating in the QI project. Participants in the QI were at risk of experiencing emotional discomfort or embarrassment due to the nature of the questions within the BDI-2 screening tool and sensing a loss of privacy due to the location where the BDI-2 screening tool was completed. Approximately, two participants reported they were uncomfortable completing the tool in the waiting area. To prevent any further emotional discomfort, embarrassment, or concerns with privacy, the secretary, as instructed in the educational session, directed the participants to an empty room to complete their depression screening tool. Although there were reports of some emotional discomfort, most participants did not share any concerns with completing the tool in the clinic's waiting area. Since majority of the participants did not share experiencing the potential risks associated with the QI project, the implementation of the QI was deemed successful

Analysis and Discussion of Findings

Analysis

Pre- and post-implementation data was collected through retrospective chart reviews. The demographic variables assessed were gender and age. Key variables collected which addressed the PICO question identified whether participants were screened for depression in the pre- and post-implementation periods and whether their BDI-2 tool was positive for depressive symptoms. Since an updated version of the BDI tool was used during the implementation period, positive depression screening scores differed in the pre- and post-implementation periods though both were indicative of the same level of depression. During the pre-implementation period, 20 participants met

eligibility requirements and were included in the QI project. The age of participants in the pre-implementation period ranged from 44 to 66 years with the average age of participants being 55 years. Of the total baseline population, 35% were male (*n*=7) while 65% of the population were female (*n*=13). In the baseline population 15% were screened for depression (*n*=3) and none of the participants had a depression screening score which indicated they had mild to severe depressive symptoms.

In the post-implementation period, a total of 21 participates met the eligibility requirements. Therefore, their data was included in the QI project. The age of participants in the post-implementation period ranged from 38 years to 76 years with the average age of participants calculated at 57 years. Approximately 52.4 % of the participants were male (*n*=11) and 47.6% were female (*n*=10). During this period 61.9 % participants were screened for depression (*n*=13). Of those screened, 30% were positive for depressive symptoms (*n*=4). Of those screened who were positive for depressive symptoms, 50 %were male (*n*=2) and 50% were female (*n*=2).

Discussion

It is important to compare group characteristics because it can help the researcher draw conclusions about the data and assess whether the sample is a representation of the population of focus (Polit & Beck, 2017). Overall, the pre- and post- implementation groups were similar in relation to the average age of the participant and the number of participants included in the QI project. However, the groups differed demographically in regard to the male to female ratio. In the pre-implementation group, there were more females than males (65% vs 35%). In the post-implementation group, there were more males than females (52.4% vs 47.6%). According to the ADA (2019), women are more

likely than men to develop DM and are two times more likely to develop depression. Bădescu et al. (2016) proposes that this may occur due to the biological makeup of females.

In the post-implementation period of the QI project, the results are not consistent with current literature. This may have occurred due to the size of the sample. Since the sample size was small and few demographics were gathered, it is difficult to determine whether the results gathered can be generalized.

This QI project explored the effects a systematic depression screening process had on the number of patients screened for depression when compared to current depression screening practices. Similar to results found in Henry et al. (2019), Camacho et al. (2017), Sundeen et al. (2020), and Tao (2017), routine depression screenings, especially during an AWV increased the frequency patients were screened for depression. In this QI project's pre-implementation group, 15% (*n*=3) of the participants were screened for depression (See Table 1). However, in the post-implementation group, 61.91% (*n*=13) of the participants were screened for depression (See Table 2). The results reveal that the systematic depression screening process did improve depression screening practices and increase the number of patients identified with depression. The utilization a systematic approach is essential in QI projects because it promotes uniformed quality of care (Finkelman, 2018).

Consequently 38% (*n*=8) of participants were not screened in the post-implementation group. Although this is a significantly lower percentage compared to the 85% (*n*=17) of participants in the pre-implementation group, the percentage gap prompted the researcher to explore the cause. The researcher found that participants were

more likely not to be screened in the beginning of the implementation period compared to the end of the implementation period. This may have occurred due to the increased workload the office staff experienced early on during the implementation process and the new depression screening process implemented. Finkelman (2018) proposes that staff members may be resistant to change when new processes are implemented in health organizations.

In addition, the QI project's results revealed that routine depression screenings increase the number of patients identified with depression early on. According to the ADA (2019), approximately 25% of patients with diabetes have depression. In this QI project, 30% (n=4) of the participants in the post-implementation group were positive for mild to severe depressive symptoms. However, none of the participants in the pre-implementation group were positive for depressive symptoms. This result is similar to the initial depression screening results conducted by Hernández-Jiménez et al (2019) in which results were higher than the expected estimated population with depression.

There were several limitations which impacts the ability for this QI project to be generalized. To begin with, the sample size was small. A small sample size prevents the data from being a true representation of the population of focus (Polit & Beck, 2017).

Secondly, the interactions with the researcher via the educational session, weekly and bi-weekly meetings with staff, and the researcher's presence volunteering in the facility during the implementation process needed to be taken into account when considering generalizability. The effects of the interaction between the researcher and the office staffare known as the Hawthorne effect. The Hawthorne effects suggests that regular interactions between the researcher and participants may cause the participants to

adjust their behavior to accommodate the QI project (Polit & Beck, 2017).

Table 1

Pre-Implementation Data: Depression Screening Frequencies

Depression Screening	Frequency	Percent
Not Screened	17	85.0
Screened	3	15.0
Total	20	100.0

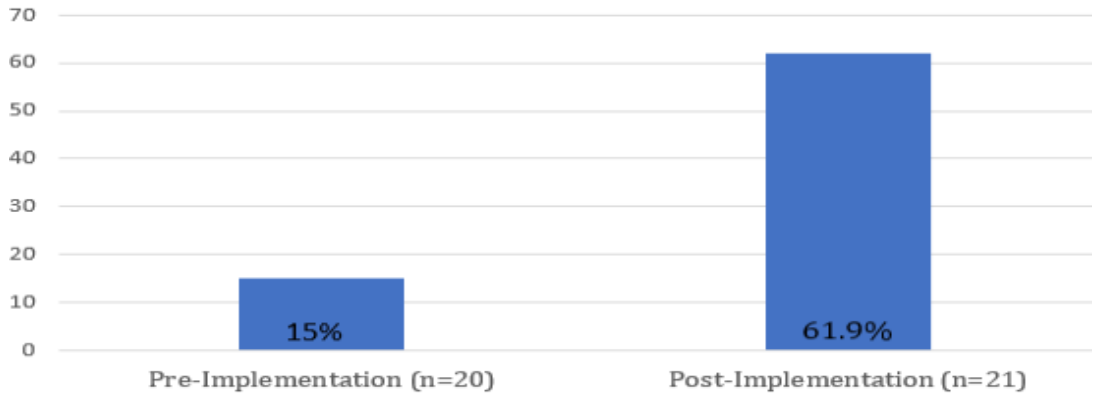
Table 2

Post-Implementation Data: Depression Screening Frequencies

Depression Screening	Frequency	Percent
Not Screened	8	38.1
Screened	13	61.9
Total	21	100.0

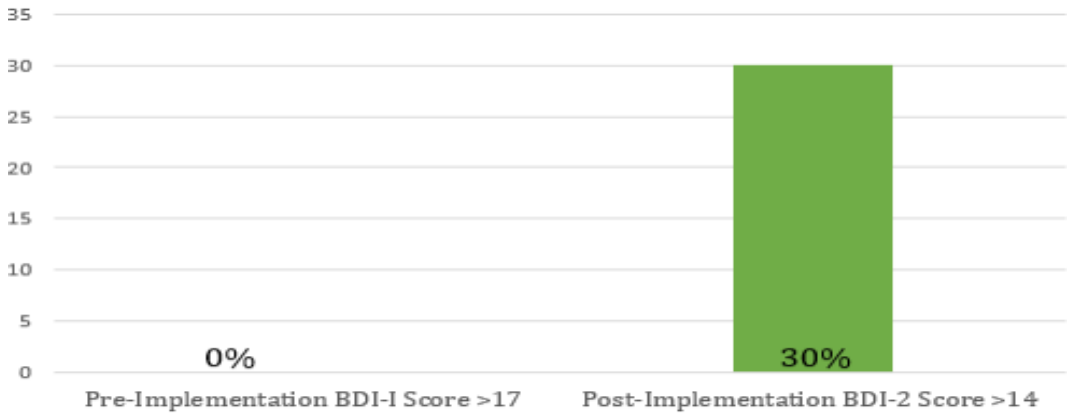
Figure 1

Depression Screening Percentages



Note: This graph depicts the percentage of participants screened for depression in both the pre and post implementation periods. The sample size in the pre-implementation period is 20 and the sample size in thepost-implementation period is 21.

Figure 2
Depressive Symptoms



Note: This graph depicts the percentage of participants who were screened for depression and had apositive depression screening score.

Recommendations

Economic Considerations

In order to implement this QI project, the BDI-2 screening tool was purchased. The BDI-2 screening tools cost approximately $50 for 25 tools. In order for the collaborating facility to continue to use the BDI-2 screening tool, the provider had to consider the additional expense the clinic would have to incur if continuing with the tool. When deciding on whether to continue to purchase the BDI-2 tool, the provider of the collaborating facility also took into account the potential economic and health benefits of using this tool for their patients. For instance, depression screenings are considered preventative services (Savoy & O' Gurek, 2016). Therefore, under the Affordable Care Act, both the Center for Medicare and Medicaid Services and private insurance companies are required to pay for routine depression screenings regardless of the screening tool used (Savoy & O' Gurek, 2016). This means that the provider would be reimbursed for future costs associated with the purchase of the screening tool. Another

benefit of using a validated depression screening tool is that if can help identify depression early on and improve the overall DM management. Despite the overall benefits of using the BDI-2 screening tool, the initial expense of the tool is the providers responsibility. So, if the provider was to continue to use the tool they must designate additional resources towards purchasing the tool. Since the collaborating facility had limited financial resources, the provider decided to discontinue its use after the QI project was completed. The NP will return to using the earlier version of the BDI tool until they can find a more affordable depression screening tool.

DNP-Prepared APRN as a Leader

A DNP-prepared advanced practice registered nurse (APRN) can serve as a leader in QI projects and complex organizational systems because of the knowledge obtained related to system leadership and interprofessional collaboration (Hammatt & Nies, 2015). System leadership and interprofessional collaboration each play an integral role in promoting positive healthcare reform. System leadership incorporates the understanding of practice management, policies, procedures, and QI interventions to support ongoing improvements in patient outcomes (AACN, 2006). Interprofessional collaboration in QI projects and complex organization systems enables health professionals to work in teams to achieve safe, efficient, and effective care (AACN, 2006). This DNP QI project has been instrumental in the developing the DNP student to serve as a leader in health organizations. This project's development allowed the DNP student to lead a QI project which included assessing and evaluating policies and procedures in place at the collaborating facility so that a feasible and sustainable systematic approach to screen patients with T2D for depression could be developed. Part of developing this sustainable

process required that the DNP student perform ongoing process evaluations to identify gaps in the implementation phase. By performing process evaluations and implementing improvements, a continuous QI approach was established (Finkelman, 2018). Moreover, the DNP project facilitated the use of inter-professional collaboration. In the QI project, the DNP student was able to effectively collaborate and communicate with an academic faculty member, a nurse practitioner, and ancillary staff members at the collaborating facility to strategically assess current screening practices and implement and translateEBP in the clinical setting through a new systematic screening process.

DNP-Prepared APRN as an Innovator

Similar to serving as leaders in complex organizational systems and QI projects, a DNP-prepared APRN can serve as an innovator. A DNP-prepared APRN is an innovator when they utilize EBP and implementation science to translate clinical pathways and guidelines into the clinical setting to improve the quality and delivery of healthcare (Burson et al., 2016). Burson et al. (2016), suggests that through the process of EBP implementation, new information about the quality of care and healthcare practice is created, which can improve patient outcomes, transform healthcare management, and add to nursing knowledge. This DNP QI project was influential in the development of the DNP student's ability to serve as an innovator. During this QI project's planning stage, the DNP student examined literature to determine what was considered best practice for depression screening in the diabetic community. The DNP student found that the ADA (2019) recommended screening patients with T2D at least annually and when patients presented with diabetes complications, demonstrated adverse changes to their overall health, or showed depressive symptoms. The literature review also revealed a variety of

depression screening practices. The DNP student performed a literature analysis which helped identify that depression screening in the diabetic population should occur during AWVs.

Process and Outcome Recommendations

Overall, this QI project was successfully implemented. However, process and outcome recommendations were still considered in order to improve the feasibility, sustainability, and projected health outcomes of this and future QI projects. To improve the feasibility and sustainability of this QI project, the collaborating facility should utilize a depression screening tool which is free and readily accessible. Financial limitations were a major barrier for the facility. Although depression screenings can be reimbursed by insurance companies, the initial cost of purchasing the tool is the responsibility of the facility. So, by using a free depression screening tool the facility will not have to designate financial resources towards purchasing a screening tool. Also, a depression screening tool should be incorporated into the EHR. During the post-implementation de-brief, the NP students reported that having a paper depression screening tool disrupted their workflow when they were charting and created a paper trail. They identified that a depression screening tool which is included in the EHR may help improve access to depression screening tools, compliance to depression screenings, and help reduce the NP and office staff workload. This recommendation is conclusively supported by EBP literature (Bajracharya et al., 2016; Loeb et al., 2015; Hernández-Jiménez et al., 2019; Henry et al., 2019). Several articles were reviewed during the literature analysis which utilized this practice. These articles found that health providers were more likely to screen and document depression screening assessments when the tool was embedded in

an EHR (Bajracharya et al., 2016; Loeb et al., 2015; Hernández-Jiménez et al., 2019; Henry et al., 2019).

In order to improve the process of this QI project or other QI projects similar to this topic, the researcher recommends spending more time in the planning phase understanding the workflow of the collaborating facility and engaging all stakeholders in the QI project early on. Several barriers impacted the clinic's workflow, such as increased patient load, COVID-19, and decreased staff. All of these barriers impacted the depression screening process. Finkelman (2018) states that "understanding of workflow and impact on staffing is a critical component of improving work processes" (p.393). To improve the process, the researcher should have spent more time in the clinic understanding how it functions, the roles and responsibilities of staff members, and identifying potential barriers in the workflow that could impede the depression screening process. Simultaneously, the researcher should have engaged and collaborated with all of the office's staff members early on to obtain buy-in. Buy-in is a crucial component of QI projects because when staff feel they are part of the change process, they are more likely to participate in the project (Finkelman, 2018). Furthermore, engaging and collaborating with office staff early on would help identify potential challenges specific to each staff member's role. Therefore, the researcher should engage and collaborate with staff members earlier.

In the future, to improve the management of DM in the collaborating facility, additional research could be conducted to assess biomarkers such as hemoglobin A1C or cholesterol levels in patients with T2D whose depression screening was positive for depressive symptoms. Literature contends that depression in the diabetic community is

linked to poor glycemic control and DM management (Bădescu et al., 2016; Barnacle et al., 2016; Egede et al., 2016; Kearns et al., 2017). Therefore, collecting additional information such as biomarkers could help to determine negative implications of depression in patients with T2D in the collaborating facility.

Dissemination

This QI project was formally presented to faculty members and peers at Salisbury University on April 16, 2021. The QI project was informally presented to the collaborating facility in January 2021. After the presentation was completed and the final DNP paper was approved by the faculty project chair, a digital manuscript was submitted to Salisbury University's archive and ProQuest Dissertations and Theses. The researcher will also disseminate findings by submitting manuscripts to journals specific to DM management and the DNP profession. Additionally, the researcher will submit their abstract to local nursing and APRN associations so they can present at conferences. By the end of May 2022, the researcher hoped to share finding with others through at least two of the avenues listed above.

Summary

In conclusion, the ADA identified that a crucial element used to improve DM management int the diabetic population is the early identification of depression (ADA, 2019). Thus, the ADA recommends routine depression screenings (2019). Despite recommendations, literature reveals that routine depression screenings may not be consistently performed among individuals with T2D (Bădescu et al., 2016). Therefore, a systematic depression screening process utilizing the BDI-2 screening tool was implemented based on EBP recommendations with the aim to increase screenings and

identify depressive symptoms earlier. To successfully implement a QI project in the primary care setting, the researcher utilized the TBP to identify factors that affected the provider's behavior towards current and proposed depression screening practices. Moreover, the researcher used the ACE Star Model to help examine, analyze, implement, and evaluate current EBP literature recommendations into the clinical setting. Similar to current literature, the results revealed that depression screenings during AWV increases depression screening frequencies and the number of patients identified with depressive symptoms.

References

American Diabetes Association [ADA]. (2019). Comprehensive medical evaluation and assessment of comorbidities: Standards of medical care in diabetes- 2019. *Diabetes Care, 40*(1), 34–45. https://care.diabetesjournals.org/content/42/Supplement_1/S34.full-text.pdf

American Diabetes Association. (2020). *Fast facts: Data and statistics about diabetes.* https://professional.diabetes.org/sites/professional.diabetes.org/files/media/sci_2020_diabetes_fast_facts_sheet_final.pdf

American Psychological Association. (n.d.). *Beck depression inventory*. https://www.apa.org/pi/about/publications/caregivers/practice-settings/assessment/tools/beck-depression

Bădescu, S. V., Tătaru, C., Kobylinska, L., Georgescu, E. L., Zahiu, D. M., Zăgrean, A. M., & Zăgrean, L. (2016). The association between diabetes mellitus and depression. *Journal of Medicine and Life, 9*(2), 120–125.

Bajracharya, P., Summers, L., Amatya, A. K., & DeBlieck, C. (2016). Implementation of a depression screening protocol and tools to improve screening for depression in patients with diabetes in the primary care setting. *Journal for Nurse Practitioners, 12*(10), 690–696. https://doiorg.proxysu.researchport.umd.edu/10.1016/j.nurpra.2016.08.009

Barnacle, M., Strand, M. A., Werremeyer, A., Maack, B., & Petry, N. (2016). Depression screening in diabetes care to improve outcomes. *Diabetes Educator, 42*(5), 646–65. https://doi-org.proxy-su.researchport.umd.edu/10.1177/0145721716662917

Burson, R., Moran, K. J., & Conrad, D. (2016). Why hire a doctor of nursing practice–prepared nurse? The value added impact of the practice doctorate. *Journal of Doctoral Nursing Practice, 9*(1), 152–157. https://doi-org.proxy-su.researchport.umd.edu/10.1891/2380-9418.9.1.152

Choi, Y. J., & Smaldone, A. M. (2018). Factors associated with medication engagement among older adults with diabetes: Systematic review and meta-analysis. *Diabetes Educator, 44*(1), 15–30. https://doi-org.proxy-su.researchport.umd.edu/10.1177/0145721717747880

Camacho, F., Yao, N., & Anderson, R. (2017). The effectiveness of Medicare wellness visits in accessing preventive screening. *Journal of Primary Care & Community Health, 8*(4), 247-255. https://doi.org/10.1177/2150131917736613

Egede, L. E., Bishu, K. G., Walker, R. J., & Dismuke, C. E. (2016). Impact of diagnosed depression on healthcare costs in adults with and without diabetes: United States, 2004-2011. *Journal of Affective Disorders, 195*(1), 119–126. https://doi-org.proxy-su.researchport.umd.edu/10.1016/j.jad.2016.02.011

Finkelman, A. (2018). *Quality improvement: A guide for integration in nursing*. Jones & Bartlett Learning.

Hammatt, J. S., & Nies, M. A. (2015). DNP's: What can we expect. *Nurse Leader, 13*(6), 64–67. https://doi-org.proxy-su.researchport.umd.edu/10.1016/j.mnl.2015.03.014

Henry, T. L., Schmidt, S., Lund, M. B., Haynes, T., Ford, D., Egwuogu, H., Schmitz, S., McGregor, B., Toomer, L., & Bussey-Jones, J. (2019). Improving depression screening in underserved populations in a large urban academic primary care center: A provider-centered analysis and approach. *American Journal of Medical*

Quality,1(1), 1-8. https://doi-org.proxy-su.researchport.umd.edu/10.1177/1062860619884639

Hernández-Jiménez, S., García-Ulloa, A. C., Bello-Chavolla, O. Y., Aguilar-Salinas, C. A., & Kershenobich-Stalnikowitz, D. (2019). Long-term effectiveness of a type 2 diabetes comprehensive care program: The CAIPaDi model. *Diabetes Research & Clinical Practice, 151*, 128–137. https://doi-org.proxy-su.researchport.umd.edu/10.1016/j.diabres.2019.04.009

Jackson-Koku, G. (2016). Beck depression inventory. *Occupational Medicine*, *66*(2), 174–175. https://doi.org/10.1093/occmed/kqv087

Janssen, E. P. C. J., Köhler, S., Stehouwer, C. D. A., Schaper, N. C., Dagnelie, P. C., Sep, S. J. S., Henry, R. M. A., Kallen, C. J. H., Verhey, F. R., & Schram, M. T. (2016). The patient health questionnaire-9 as a screening tool for depression in individuals with type 2 diabetes mellitus: The maastricht study. *Journal of the American Geriatrics Society, 64*(11), e201–e206. https://doi-org.proxy-su.researchport.umd.edu/10.1111/jgs.14388

Jin, H., & Wu, S. (2019). Use of patient-reported data to match depression screening intervals with depression risk profiles in primary care patients with diabetes: Development and validation of prediction models for major depression. *JMIR Formative Research*, *3*(4), 1-12. https://doi-org.proxy.org.proxy-su.researchport.umd.edu/10.2196/13610

Joseph, L. M., Berry, D. C., Jessup, A., Davison, J., Schneider, B. J., & Twersky, J. I. (2018). Implementing and feasibility testing depression screening using the electronic medical record for patients with type 2 diabetes admitted to the hospital. *Nursing Open,*

6(1), 30. https://doi-org.proxy- su.researchport.umd.edu/10.1002/nop2.181

Diabetes Research and Clinical Practice, 131(1), 179–186. https://doi-org.proxy-su.researchport.umd.edu/10.1016/j.diabres.2017.03.013

Loeb, D., Sieja, A., Corral, J., Zehnder, N. G., Guiton, G., & Nease, D. E. (2015). Evaluation of the role of training in the implementation of a depression screening and treatment protocol in 2 academic outpatient internal medicine clinics utilizing the electronic medical record. *American Journal of Medical Quality, 30*(4), 359–366. https://doi.org.proxy.su.researchport.umd.edu/10.1177/1062860614532681

LaMorte, W.W. (2019). *The theory of planned behavior*. http://sphweb.bumc.bu.edu/otlt/MPH-Modules/SB/BehavioralChangeTheories/BehavioralChangeTheories3.html

Melnyk, B. M., & Fineout-Overholt, E. (2015). *Evidence-based practice in nursing & healthcare: A guide to best practice* (3rd ed.). Wolters Kluwer Health.

Petrak, F., Baumeister, H., Skinner, T. C., Brown, A., & Holt, R. I. G. (2015). Depression and diabetes: Treatment and health-care delivery. *The Lancet- Diabetes & Endocrinology, 3*(6), 472–485. https://doi-org.proxy-su.researchport.umd.edu/10.1016/S2213-8587(15)00045-5

Pfoh, E., Mojtabai, R., Bailey, J., Weiner, J. P., & Dy, S. M. (2015). Impact of medicare annual wellness visits on uptake of depression screening. *Psychiatric Services, 66*(11), 1207–1212. https://doi-org.proxy-su.researchport.umd.edu/10.1176/appi.ps.201400524

Polit, D. F., & Beck, C. T. (2017). *Nursing research: Generating and assessing evidence for nursing practice* (10th ed.). Wolters Kluwer.

Rauwerda, N. L., Tovote, K. A., Peeters, A. C. T. M., Sanderman, R., Emmelkamp, P. M. G., Schroevers, M. J., & Fleer, J. (2018). WHO-5 and BDI-II are acceptable screening instruments for depression in people with diabetes. *Diabetic Medicine, 35*(12), 1678–1685. https://doi-org-proxy.su.researchport.umd.edu/10.1111/dme.13779

Savoy, M., & O'Gurek, D. (2016). Screening your adult patients for depression. *Family Practice Management, 23*(2). 16-20.

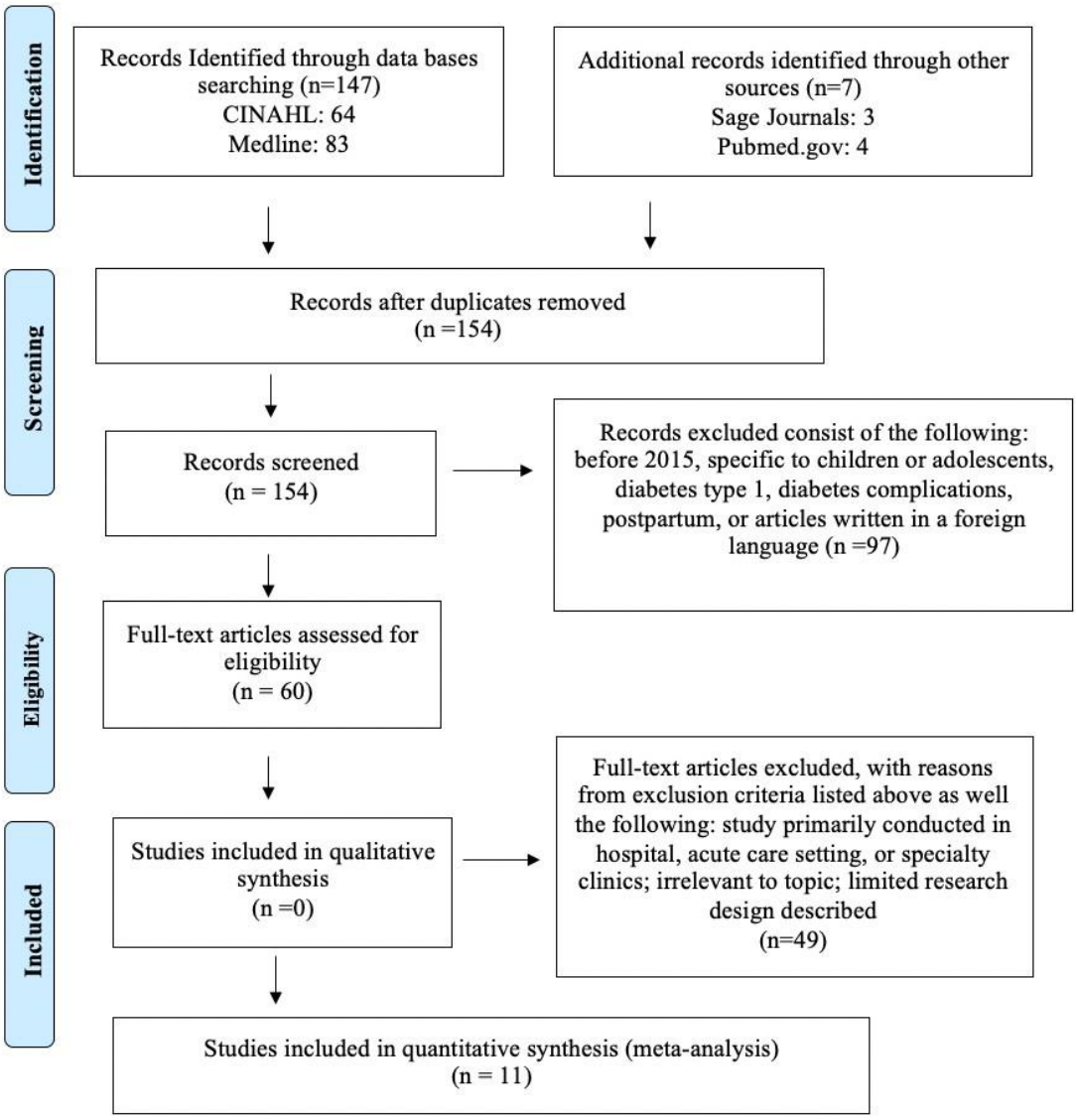
Straatmann, T., Rothenhöfer, L. M., Meier, A., & Mueller, K. (2018). A configurational perspective on the theory of planned behaviour to understand employees' change-supportive intentions. *Applied Psychology: An International Review, 67*(1), 91–135. https://doi-org.proxy-su.researchport.umd.edu/10.1111/apps.12120

Sundeen, E., Powell, W., & Deuell, R. (2020). Leveraging the annual wellness visit to improve rural depression management. *Online Journal of Rural Nursing and Health Care, 20*(1), 1-31. http://dx.doi.org.proxy-su.researchport.umd.edu/10.14574/ojrnhc.v20i1.602

Tao, G. (2017). Utilization pattern of other preventive services during the US medicare annual wellness visit. *Preventive Medicine Reports, 10*, 210–211. https://doi-org.proxy-su.researchport.umd.edu/10.1016/j.pmedr.2017.12.014

Appendices

Appendix A: PRISMA Diagram



Appendix B. Table of Evidence

Citation	Design/ Purpose	Sample/ Setting	Major Variable (MV)& Measurement of MV	Data Analysis	Study Findings	Appraisal of Worth to Practice	Strength & Quality of Evidence
Valid and Reliable Depression Screening tools for DM							
Janssen, E. P. C. J., Köhler, S., Stehouwer, C. D. A., Schaper, N. C., Dagnelie, P. C., Sep, S. J. S., Henry, R. M. A., Kallen, C. J. H., Verhey, F. R., & Schram, M. T. (2016). The patient health questionnaire-9 as a screening tool for depression in individuals with type 2 diabetes mellitus: The maastricht study. *Journal of the American Geriatrics Society, 64*(11), e201–e206. https://doi-org.proxy-su.researchport.um	Design: observational, cross-sectional Intervention: PHQ-9 questionnaire Dependent variable: depressive disorder, psychometric properties of tool Purpose: to assess psychometric properties and cut off score of PHQ-9 questionnaire for depression in patients with T2D	Sample: convenience n=2997 Inclusion criteria: adults 40 to 75 years in the southern part of the Netherlands with T2D Setting: Maastricht Netherlands primary care setting	Major variable: Screen positive for depression Measurement of major variables: DSM-IV, PHQ-9, and MINI	$p \leq 0.05$ SPSS version 20.0 Chi-square	Internal consistency Cronbach alpha 0.87 for patients with T2D (good) PHQ-9 cutoff score of 5 or more had best sensitivity (92%) and specificity (70.4%) for screening positive for depression PHQ-9 psychometric properties similar to the psychometric properties of individuals without DM who are screened using the PHQ-9 tool	Large sample size Data collected from November 2010 to September 2013 Conducted with only people from the Netherlands Compared PHQ-9 to the MINI depression screening tool which is the tool used to diagnose	2A

d.edu/10.1111/jgs.14388						patients with depression	
Rauwerda, N. L., Tovote, K. A., Peeters, A. C. T. M., Sanderman, R., Emmelkamp, P. M. G., Schroevers, M. J., & Fleer, J. (2018). WHO-5 and BDI-II are acceptable screening instruments for depression in people with diabetes. *Diabetic Medicine, 35*(12), 1678–1685. https://doi-org.proxy-su.researchport.umd.edu/10.1111/dme.13779	Design: Random control trial Intervention: WHO-5 and BDI-II screening tools Dependent variable: response rate, completion level, appreciation, agreeableness, and accuracy of screening tool Purpose: examine BDI-II and WHO-5 abilities to measure depression in patients with DM	Sample: Random assignment n=453 Inclusion criteria: adults 18 years to 70 years with Type 1 or 2 DM Exclusion criteria: people with severe psychiatric problems, unable to read Dutch, have visual problems, or are pregnant Setting: outpatient clinics	Major variables: response rate, completion level, appreciation, agreeableness, and accuracy Measurement of major variables: questionnaire	Logic regression ANCOVA $P \leq 0.05$	WHO-5 had higher reports of appreciation ($p=0.002$) and agreeableness ($p=0.035$) scores when patients completed the questionnaire No significant difference in response rate and completion level between WHO-5 and BDI-2 WHO-5 and BDI-2 both acceptable depression screening tools for patients with DM	Data collection from November 2011 to March 2013 Moderate sample size WHO-5 screening group smaller than BDI-II screening group	1A

Citation	Design/ Purpose	Sample/ Setting	Major Variables & Measurement of Major Variables	Data Analysis	Study Findings	Appraisal of Worth to Practice	Strength & Quality of Evidence
Systematic Depression Screenings							
Bajracharya, P., Summers, L., Amatya, A. K., & DeBlieck, C. (2016). Implementation of a depression screening protocol and tools to improve screening for depression in patients with diabetes in the primary care setting. *Journal for Nurse Practitioners, 12*(10), 690–696. https://doi-org.proxy-su.researchport.umd.edu/10.1016/j.	Design: retrospective, post-intervention, quasi experiment Diffusions of Innovations framework Intervention: implement depression screening questionnaire into electronic health record Dependent variable: depression screening prevalence	Sample: convenience sample n=378 Inclusion criteria: 18 years or older with T2D scheduled for primary care services Setting: primary care clinics in New Mexico	Major variables: number of patients screened and depression prevalence Measurement tools of major variables: PHQ-2 and PHQ-9	Descriptive statistics SPSS version 20 Independent *t*-test Chi-square test $p \leq 0.05$	66 not screened 312 screened ($p<0.0001$) 85% screened with PHQ-2 questionnaire 25.6% positive for depression 44.2% were severely depressed, 31.6% moderately depressed, 21.1% mildly depressed	Provided training to staff members Power analysis Conducted over 30-day period Multidisciplinary approach Valid and reliable questionnaire available in English and Spanish Treatment initiated post results	Level 2A

nurpra.2016.08.009	Purpose: determine the effectiveness of implementing depression screening tools and protocol for patients with T2D					Not randomized	
Camacho, F., Yao, N., & Anderson, R. (2017). The effectiveness of medicare wellness visits in accessing preventive screening. *Journal of Primary Care & Community Health, 8*(4), 247-255. https://doi.org/10.1177/2150131917736613	Design: observational, Retrospective Dependent variable: Screening rates for cancer, vaccines, diabetes, and cardiovascular disease Purpose: examine the impact of preventative screenings during AWVs	Sample: Convenience n=52,300 Inclusion: 18 years or older with Medicare Setting: primary care setting	Major variables: frequency of cancer (colon, breast, prostate), cardiovascular disease, diabetes, vaccinations Measurement tools of major variables: EHR	Multinomial logistic regression Frequency and Percentages $p \leq 0.05$	Patients who did not receive their AWV were less likely to receive preventative services screening (63% vs 88%) Total number of preventative screenings received patients who received an AWV was 62% higher than patients who did not receive an AWV Wellness visits improve screening rates	Conducted from 2011-2014 Large sample size Screening tool used are unknown tools or validity of tools used to screen patients with	3A

Henry, T. L., Schmidt, S., Lund, M. B., Haynes, T., Ford, D., Egwuogu, H., Schmitz, S., McGregor, B., Toomer, L., & Bussey-Jones, J. (2019). Improving depression screening in underserved populations in a large urban academic primary care center: A provider-centered analysis and approach. *American Journal of Medical Quality, 1*(1), 1-8. https://doi-org.proxy-su.researchport.umd.edu/10.1177/1062860619884639	Design: Plan-Do-Act-Study, retrospective chart review, and cross-sectional study Intervention: annual depression screening using PHQ-2 and PHQ-9 Dependent variable: depression prevalence Purpose: to increase depression screening in primary care centers using depression questionnaire for patients and with chronic illness by assessing provider	Sample: stratified random sampling n=1467 Inclusion criteria: 18 years or older with chronic illnesses Exclusion criteria: patients receive hospice care, or has a history of bipolar or major depression disorder in last year Setting: three primary care clinics	Major variable: rate of completed questionnaire during visit Measurement of major variables: PHQ-9	Descriptive statistics Stata IC 15.1 analysis software $P \leq 0.05$ scatterplots	In the pre-intervention period 29% of patients were screened for depression, and 10% tested positive for depression In post-intervention period 64%of patients were screened for depression, and 20% tested positive for depression Barriers identified included lack of prioritization of depression as a clinical problem, need for staff to conduct screenings, need for depression screening tool embedded in electronic health record, and lack of education around management and referrals for providers	Conducted between January 2016 and June 2017 Educational program provided to staff which consists of referral resources, treatment guidelines, decision-support tools Valid and reliable depression screening tool No effect size identified Large sample size	Level 2A

	screening barriers and implementing a system which supports annual depression screenings						
Hernández-Jiménez, S., García-Ulloa, A. C., Bello-Chavolla, O. Y., Aguilar-Salinas, C. A., & Kershenobich-Stalnikowitz, D. (2019). Long-term effectiveness of a type 2 diabetes comprehensive care program: The CAIPaDi model. *Diabetes Research & Clinical Practice, 151*, 128–137. https://doi-org.proxy-su.researchport.umd.edu/10.1016/j.	Design: cross-sectional quasi experiment Intervention: medical care, diabetes education, nutrition, physical activities, annual psychological evaluation and assessment, eye exam, foot and dental care Dependent variable: biophysical markers, frequency of	Sample: convenience sample n=1243 (visits 1-4) n=628 (visit 5) n=288(visit 6) Inclusion: 18 years or older with T2D diagnosis less than 5 years, absent of DM complications Setting: inpatient and outpatient	Major variables: Blood pressure, LDL cholesterol, HbA1c, number of patients seen, achieving metabolic goals, empowerment, depression and anxiety, quality of life, diabetes distress Measurement of major variables: Diabetes Empowerment Scale-Short Form, Hospital	Descriptive statistics Chi-square test U-Mann Whitney test Logistic regression $p \leq 0.05$ $p \leq 0.001$	38.9% of patients had depression in first visit, 12.4% tested positive for with depression by the 4th visit, 21.3% by the 5th visit, 15.1% tested positive for depression by 6th visit ($p<0.001$)	Multidisciplinary comprehensive program consisting of endocrinologist, diabetes educator, nutritionist, psychologist, dentist, psychiatrist, physical therapist, ophlathmologist Study conducted from November 2012 to June 2018	Level 2B

diabres.2019.04.009	depression screenings, perception of empowerment and quality of life Purpose: to evaluate the comprehensive treatment program for patients with T2D		Anxiety and Depression Scale, Diabetes Quality of Life Measure, Problem Area un Diabetes Questionnaire, Diabetes Knowledge scale, and International Physical Activity Questionnaire			Participants had six visits Use of procedure manuals, treatment algorithms embedded into electronic health record Low attrition rate Valid depression screening questionnaire Large sample size	
Jin, H., & Wu, S. (2019). Use of patient-reported data to match depression screening intervals with depression risk profiles in primary care	Design: quasi experiment, interview at 6, 12 and 18-month follow-ups	Sample: convenience sample n=1406 Inclusion: English or Spanish speaking who are 18	Major variables: rate of depression, functional impairment, rates of anxiety, DM symptoms and self-efficacy	Least Absolute Shrinkage and Selection Operator-regression bases mining technique	PHQ-2 scores, frequent diabetes symptoms, and some depressive symptoms were at risk for depression at 6 months advised to receive follow-up care and re-evaluation	Control group Valid and reliable depression screening tool Participants encouraged to receive	Level 2B

patients with diabetes: Development and validation of prediction models for major depression. *JMIR Formative Research, 3*(4), e13610. https://doi-org.proxy-su.researchport.umd.edu/10.2196/13610	Intervention: automated phone depression screenings every 3 months (2-minute conversation) Dependent variable: depression screening rates Purpose: develop tools for predicting risk of depression for patients with diabetes in a primary care setting	years or older with T2D Exclusion criteria: history of suicidal ideation, cognitive impairment, alcohol abuse, recent lithium and antipsychotic medications Setting: 8 primary care clinics in Los Angeles, California	Measurement of major variables: PHQ-2 and PHQ-9, Sheehan disability Scale Chronic pain questionnaire, Brief Symptom Inventory, Whitty 9-item questionnaire, Diabetes Self-care Activities Questionnaire	Logistic regression	Self-reported impaired daily functioning were risk factors for depression	follow-up care and re-evaluation post Conducted between 2010 through 2013 50% did not respond to phone call No statistical significance provided only means	
Loeb, D., Sieja, A., Corral, J., Zehnder, N. G., Guiton, G., & Nease, D. E. (2015). Evaluation of the role of training in the	Design: Retrospective review, quasi-experiment Intervention: depression screening administered	Sample: convenience sample n=58 Inclusion criteria: all new patients and	Major variable: depression screening and follow-up care frequency Measurement of major variables:	SA version 9.2 Logistic regression Odds ratio $p \leq 0.05$	2.4 times increased odds of documenting a PHQ-9 when the patient had a positive PHQ-2 2.5 times increased odds of repeating the PHQ-9 after a positive PHQ-9	Small sample size Valid and reliable depression questionnaire	Level: 2B

implementation of a depression screening and treatment protocol in 2 academic outpatient internal medicine clinics utilizing the electronic medical record. *American Journal of Medical Quality, 30*(4), 359–366. https://doi-org.proxy-su.researchport.umd.edu/10.1177/106286061453268 1	during new patient intake and annually, and 1-hour training sessions to staff Dependent variable: depression screening prevalence Purpose: to evaluate effectiveness implementing a depression protocol and training session for providers	Setting: ccademic primary care clinics in Colorado	PHQ-2 and PHQ-9		non–statistically significant trend toward increased comfort with the protocol procedures	Conducted between 2012 to 2013 Depression screening and treatment algorithm embedded into electronic health record In person reassessment of patients with depression in 1-3 months With medication and psychoanalysis initiation/referral a 1-to-2-week follow-up recommended Effect size calculated	

						62% completed survey	
Pfoh, E., Mojtabai, R., Bailey, J., Weiner, J. P., & Dy, S. M. (2015). Impact of medicare annual wellness visits on uptake of depression screening. *Psychiatric Services, 66*(11), 1207–1212. https://doi-org.proxy-su.researchport.umd.edu/10.1176/appi.ps.201400524	Design: quasi-experiment, cross-sectional Intervention: depression screenings during AWV Dependent variable: depression screening frequency Purpose: determine whether AWV will increase depression screening rates	Sampling: quota n=4245 Inclusion criteria: adults with Medicare Setting: primary care clinics	Major variables: depression screening rates Measurement of major variables: PHQ-2, PHQ-9	Multilevel logistic regressions Percentages Odds ratio $p \leq 0.05$	Not statistically significant for depression screenings for patients with AWVs and those without AWVs 15% with non-AWV received depression screenings 10% of patients with AWV received depression screening	Data collected from September 2010 to August 2012 Use of EHR to collect data Validated screening tool Conducted in 34 different primary care clinics	2B
Sundeen, E., Powell, W., & Deuell, R. (2020). Leveraging the annual wellness visit to improve rural depression	Design: quasi-experiment Intervention: PHQ-9 depression screenings	Sample: Convivence n=66 Inclusion: adults with Medicare	Major variable: Depression screening rates Measurement of variable:	Spearman correlation Percentages $p \leq 0.05$	98.5% patients screened for depression 73.3% of patients scored >5 received follow-up care	Small sample size Data collected over 8 weeks	Level: 2B

management. *Online Journal of Rural Nursing and Health Care, 20*(1), 1-31. http://dx.doi.org.proxy-su.researchport.umd.edu/10.14574/ojrnhc.v20i1.602	during annual wellness visit Theoretical framework: Neuman Systems Model Dependent variable: Depression screening rates Purpose: Improve depression screening rates in adults by performing screening during annual wellness visits	Setting: primary care	PHQ-9 questionnaire			Small geographic location (rural location) Valid and reliable tool PHQ-9 embedded in EHR Provider asked patient depression screening questions	
Tao, G. (2017). Utilization pattern of other preventive services during the US medicare annual wellness visit. *Preventive Medicine Reports, 10*, 210–211. https://doi-	Design: Nonexperimental, retrospective Dependent variable: Depression, influenza vaccines, and sexual	Sample: Convivence Inclusion: adults with Medicare Setting: Primary care	Major variable: Screening rates	Pearson correlation Percentages $p \leq 0.05$	16% of Medicare patients had an AWV in 2014 AWV associated with increased use of preventative services 4.9% of patients screened for depression had an AWV	Large sample size (n=4.5 million records reviewed) Data collected over a year Unknown mechanism	3B

org.proxy-su.researchport.umd.edu/10.1016/j.pmedr.2017.12.014	transmitted disease screening rates Purpose: To determine if AWV impacted preventative service screenings					used to screen patients for depression Unknown depression screening tools used to screen for depression Use of EHR to collect data	

Key
AWV: Annual wellness visit
BDI-2: Beck Depression Inventory-2
DM: Diabetes Mellitus
DSM-IV; Diagnostic and Statistical Manual of Mental Disorders, 4th edition
EHR: Electronic health record
MINI: Mini-International Neuropsychiatric Interview
PHQ-2 or PHQ-9: Patient Health Questionnaire
T2D: Type 2 Diabetes
WHO-5: Well-being index

Appendix C. IRB Approval

Salisbury University
Institutional Review Board
Committee on Human Research
Phone: (410) 548-3549
Fax: (410) 677-0052
Email:humanresearch@salisbury.edu

IRB Research Protocol Approval Notification

Date: 7/31/2020

To: N. Hall
RE: Protocol #3
Type of Submission: Exempt
Type of IRB Review: Exempt
Protocol is scheduled to begin 8/2020 end 5/2021

Approval for this project is valid from 7/31/2020 to 5/31/2021

This letter serves to notify Dr. Nicole Hall that the Salisbury University (SU) Institutional Review Board (IRB) approved the above referenced protocol entitled, The Systematic Utilization of the Beck Depression Inventory - 2 Screening Tool on Patients with type 2 Diabetes on July 31, 2020.

Pursuant to Federal regulations 21 CFR 56.109, the IRB has determined that this protocol qualifies for Exempt review.

Federal regulation 45 CFR 46.103 (b)(4)(iii) requires Primary Investigators (PI), except when a subject is in immediate danger, to assure any change to an approved protocol is not initiated prior to IRB review and approval. Additionally, the PI must also inform the IRB of unanticipated problems involving risks to participants.

Your research is scheduled to begin 8/1/2020 and end 5/31/2021. It is the PI's responsibility to submit continuing review reports in a timely manner (at least 3 weeks prior to scheduled end date on the protocol approval).

The SU IRB is organized and operated according to guidelines of the United States Office for Human Research Protections and the United States Code of Federal Regulations and under Federal Wide Assurance No. FWA00020237.

If you have any questions about this review or questions, concerns, and/or suggestions regarding this process, please do not hesitate to contact the Office of Graduate Studies and Research at 410-548-3549 or humanresearch@salisbury.edu.

Appendix D. IRB Amendment

Salisbury
UNIVERSITY

☐I am the principle investigator. I am submitting this form electronically and this submission constitutes my signature.

Principal Investigator: Click here to enter text. Date: Click here to enter text.

Office use only	**Amendment #:** 3A
Submission Date: 9-9-2020	
IRB Approval Date: 9-16-2020	

Appendix E. Collaborating Facility Agreement

[redacted]

November 21, 2019

Salisbury University
School of Nursing DNP Program
1101 Camden Avenue
Salisbury, MD 21801

RE: Sharon Okeke, DNP Project

To Whom It May Concern:

This letter is my formal agreement to participate in Sharon Okeke's DNP Project. I agree to the stipulations listed in the Practicum Agreement (Indirect Focus, Appendix D). The form is attached and bears my signature and contact information.

If additional information is needed, my cell phone is the quickest way to reach me [redacted]

Sincerely,

[redacted]

Appendix F. BDI-2 Tool Permission

Dear Ms Okeke,

Thank you for your email. You indicate that you wish to use the BDI-II instrument for a graduate research project - can you please let me know if my understanding is correct, and if so if the "licensee" would you yourself (as a student) or rather [redacted]

In either case, if your research would involve using the instrument in an as-published manner (e.g. NOT modified by yourself for digital administration, translation, etc.), no separate license is needed. The published pencil/paper materials, as well as Q-Global and Q-Local formats, can simply be ordered off our website. If you wish to adapt the BDI-II in some fashion, however, can you please provide a bit more detail.

Regards,
Jeanne Kruchowski
Pearson Clinical Assessments
Permissions and Licensing

PAS.licensing@Pearson.com
For information about telepractice and Pearson's digital resources, please visit :
https://www.pearsonassessments.com/professional-assessments/digital-solutions/telepractice.html

Appendix G. Change of Practice Flyer

NOTIFICATION OF CHANGE IN PRACTICE

Effective____ all patients with diabetes will be screened for depression, using the Beck Depression Inventory screening tool during all annual physical examinations

Completing the depression screening tool is **voluntary**. By filling out the depression screening tool, ***YOU AGREE*** to be a part of the quality improvement project which involves evaluating whether a structured depression screening process helps to improve depression screening practices for patients with type 2 diabetes. ***You may withdrawal at any time***. Your depression screening results will be shared with you to determine potential follow-up treatment options.

The quality improvement project is conducted by Sharon Okeke who is a Salisbury University graduate student

WHY???

- Roughly, **1 in 4 adults** with diabetes show depressive symptoms or have depression.
- Diabetics are **2X** more likely to develop depression.
- Depression in diabetics can lead **to poor health outcomes, higher healthcare costs**, and a **decrease quality of life**.

If you have any questions about the practice change, quality improvement project, or experience adverse effects from the project please contact [redacted] or Sharon Okeke (graduate student) via email at so68010@gulls.salisbury.edu

If you have any further concerns about the project, please contact the project chair, Nicole Hall, via email at njhall@salisbury.edu or the Office of Graduate Studies and Research at Salisbury University at 410-548-3549 or toll free 1-888-543-0148

Appendix H. Educational Handout

You have just completed the Beck Depression Inventory-II (BDI-II) tool. The BDI-II is a tool used to assess for the severity of depression and/or depressive symptoms***. It IS a screening tool. It is NOT an instrument used to diagnose clinical depression*****.** All results should be reviewed by a professional and follow-up treatment discussed for those who scored 14 or higher.

Follow-up treatment may consist of the following:

- Psychoanalysis referral
- Medication management
- Psychoanalysis referral and Medication management
- Referral to other resources addressing symptoms (i.e. psychiatrist, support groups)

You scored _____

0-13=Minimal Depressive Symptoms
14-19=Mild Depressive Symptoms
20-28=Moderate Depressive Symptoms
29-63=Severe Depressive Symptoms

Appendix I. Baseline Data Tool

Pre-Implementation Data (*n* =20)			
Age	Gender (female=1 Male=2)	Screened for depression (Yes=1 No=2)	BDI-2 score ≥ 17 (yes=1 no=2)
58	Female	No	No
50	Female	No	No
50	Female	No	No
44	Female	No	No
55	Female	No	No
50	Male	No	No
60	Female	No	No
65	Female	No	No
63	Female	Yes	No
60	Female	No	No
62	Female	Yes	No
52	Male	No	No
66	Male	Yes	No
54	Male	No	No
60	Female	No	No
46	Female	No	No
54	Male	No	No
48	Male	No	No
53	Female	No	No
52	Male	No	No

Appendix J. Post-Implementation Period Data Tool

Post-Implementation Data (*n* =21)			
Age	Gender (female=1 Male=2)	Screened for depression (Yes=1 No=2)	BDI-2 score ≥ 14 (yes=1 no=2)
53	Male	No	No
63	Female	No	No
66	Male	Yes	No
44	Male	No	No
38	Female	Yes	No
51	Male	No	No
58	Female	Yes	No
62	Female	No	No
60	Male	No	No
61	Female	No	No
63	Male	No	No
63	Female	Yes	Yes
76	Male	Yes	Yes
58	Female	Yes	No
61	Male	Yes	Yes
63	Male	Yes	No
56	Male	Yes	No
60	Female	Yes	Yes
49	Female	Yes	No
43	Male	Yes	No
62	Female	Yes	No

Appendix K. SWOT Analysis

Strengths	**Weakness**
• NP encouraged quality improvement projects • NP willing to hold weekly then bi-weekly meetings during implementation period • In the last year, 60 patients with T2D were treated in the clinic • Approximately 50% of patients with T2D in the clinic do not have Medicare	• Limited resources (time and staff members) • No standard protocol for depression screenings for adults with T2D • EHR unable to alert provider when depression questionnaire is due • Budget constraints
Opportunities	**Threats**
• Improvement DM management for patients with T2D • Improve NP understanding of how depression affects T2D	• DNP project took place during a pandemic • Several larger primary clinics in surrounding area

Appendix L Timeline

Activity	Time Frame
Obtain letter from collaborating facility	November 2019
Approval of DNP topic	December 2019
Begin IRB application	January 2020
Submit IRB application	June 9, 2020
Obtain IRB Approval	July 31, 2020
Meet with collaborating facility to review and provide 30-minute educational session about project	August 13,2020 September 24, 2020 (NP students)
Collect baseline data	August 10, 2020 to August 2020
Implement intervention	September 1, 2020 to December31, 2020
Weekly meetings with collaborating facility to discuss challenges, barriers, and overall progress of project	September 1, 2020 September 10, 2020 September 17, 2020 September 24, 2020
Meet with project advisor to review how project is progressing	September 2, 2020
Submit IRB Amendment Form and obtain approval	September 9, 2020
Bi-weekly meetings with collaborating facility to discuss the progress of project	October 2020 to December 2020
Meet with project advisor to review how project is progressing	October 9, 2020
Meet with project advisor to review progress of project	December 2020
Data analysis	January 2021
Post-Debrief meeting with collaborating facility	January 2021
Submit paper to project chair	February 7, 2021
Select journals for abstract submission	March 2021
Present DNP project	April 16, 2021