INCREASING PROVIDERS COMPLIANCE WITH PHQ-9 SCREENING FOR

ADOLESCENTS IN PRIMARY CARE SETTING

by

Sadaf Carrillo

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As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Sadaf Carrillo, titled Increasing Providers Compliance with PHQ-9 Screening for Adolescents in Primary Care Setting and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

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

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DEDICATION

This is dedicated to my wonderful family, who have helped me reach my goal. To my husband, I want to tell you I love you for taking care of me and help me become a better person. Thank you for believing in me when I did not. To my sister, mom, step-dad, and in-laws, thank you for pushing me to keep going when I was ready to give up. To my wonderful aunt, thank you for reaching out and stepping up to help me out when I had no one to reach out to at the time of need. Lastly, I want to dedicate this to my father-in-law who I lost to bladder cancer during my doctoral education. I love you and wish you were here to see this. Nevertheless, this is for you.
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ABSTRACT

**Purpose:** The purpose of this quality improvement initiative was to expand the provider’s knowledge and intent in promoting the use of patient health questionnaire-9 (PHQ-9) screening.

**Background:** Depression is one of the most common and devastating mental health illnesses that negatively affects adolescents worldwide. The consistent rise has made depression a leading cause of disability and a significant burden globally. One reason for this is the lack of screening in primary care (PC) settings, causing depressive symptoms to remain undetected. The American Academy of Pediatrics now recommends routine depression screening for adolescents 12 to 18 years of age in PC settings. Though no universal tool is currently accepted, the PHQ-9 screening has proved to be one of the most reliable tools to help identify depression in the adolescent population.

**Method:** This quality improvement project consisted of a pretest-posttest quantitative design. An evidence-based educational intervention was conducted via an asynchronous learning format, discussing current recommendations for adolescent depression screening and the importance of conducting PHQ-9 screening in the PC setting. Pretest-posttest questionnaires were delivered using Qualtrics to generate, collect, and analyze data effectively. The participants were given seven days to complete the pretest-posttest questionnaire. Results were shared with the implementation site.

**Results:** Data collection took place over one week. Three providers completed the pretest-posttest questionnaires. Upon completion, providers’ knowledge increased by 13.4% after participating in the educational intervention. A six-point increase in the Likert scale was noted whereby providers were in stronger agreement to become compliant with utilizing PHQ-9
screening, better understood the Guidelines for Adolescent Depression in Primary Care (GLAD-PC), agreed with GLAD-PC, and better understood the common risk factors that are associated with adolescent depression post-intervention. Additionally, the posttest survey results of the Likert scale question on providers intent to use the PHQ-9 screening indicated 100% of providers were agreeable to using the PHQ-9 after the educational intervention.

**Conclusion:** This project has established that evidence-based training can transform participants’ beliefs, attitudes, and intent toward a target behavior. Future studies will be completed at the implementation site to promptly identify, diagnose, and treat adolescents affected or at risk for depression.
INTRODUCTION

Depression is one of the most debilitating and treatable mental health disorders in adolescents. Yet national surveys indicate that there is continued lack of screening and treatment of depression within the primary care (PC) setting. Lack of screening is a significant downfall in PC because amongst adolescents, 13.3% experience at least one major depressive episode anywhere from 12 to 17 years of age (National Institute of Mental Health [NIMH], 2019). Over the years, the National Quality Forum (2017), American Psychiatric Association (APA) (2019), and the World Health Organization (WHO) (2005) have established multiple quality improvement (QI) measures to track improvement and healthcare quality and improvement relating to youth’s depression and suicide. Despite such effort, up to 80% of adolescents continue to fail to receive the care that they need, especially since most seek care solely in the PC settings. This QI project explores the efficacy of an educational intervention using an asynchronous learning format to enhance primary care providers’ (PCPs) compliance with patient health questionnaire-9 (PHQ-9) screening.

Background Knowledge

The American Psychological Association (APA, 2020) defines depression as a pervasive negative emotional state, which ranges from a feeling of mild unhappiness and discontent to a severe sense of sorrow, nihilism, and suicidality, that impedes daily life activities. The symptoms must be present for a minimum of two weeks in order for the diagnostic criteria of major depression disorder (MDD) to be met (APA, 2017). Depression is a common mental health disorder that affects approximately 10 to 20% (WHO, 2019) of adolescents worldwide, with a five-year recurrence rate of 50% to 70% (Alsaad & Nasser, 2018). In the United States (U.S.)
alone, the incidence of depression among youths has rapidly increased from 8.7% in 2005 to 11.3% in 2014 (Aalsma et al., 2018). Depression can negatively impact the adolescent’s life by actively interfering with one’s cognitive functioning, social activity, emotional well-being, developmental milestone, and academic achievements (Ghandour et al., 2019). The prevalence of depression surges from early childhood to young adulthood. In 2016, approximately 12.8% of adolescents experienced at least one episode of depression. As much as 8% of adolescents diagnosed with depression complete suicide in young adulthood (Mullen, 2018). Subsequently, suicide rates have risen by 56% from the years 2007 to 2017 (Centers for Disease Control and Prevention [CDC], 2019). This rapid increase has caused suicide to become the second leading cause of death among adolescents 15 to 19 years of age (Shain, 2016).

In addition to suicide, mental health disorders account for one of the largest areas of medical spending. According to Suryavanshi and Yang (2016), the average annual total cost of mental health treatment for children and adolescents is approximately $10.9 billion. Furthermore, the financial burden of mental disorders in youths is primarily associated with adverse social outcomes such as an increase in substance abuse, unemployment, increased criminal behaviors, and burden in disability programs (Suryavanshi & Yang, 2016). The evidence of the economic hardship that is accompanied by mental health disorders validates the extent and the magnitude of the unaddressed and untreated mental illness in our society.

More than 80% of adolescents with depression seek care in PC settings, while less than 12% seek care in a mental health setting (Zenlea et al., 2014; Roseman et al., 2016). Two of three adolescents who do seek treatment in a PC setting fail to become diagnosed with depression (Zuckerbrot et al., 2018). According to the American Academy of Child and
Adolescent Psychiatry (AACAP) (2019) of those identified, one in five use the services needed. Moreover, for families that do seek mental healthcare services, 40 to 50% terminate services due to financial barriers, lack of transportation, mental health provider shortages, and stigma. These barriers result in approximately 25.3% of children receiving any form of care, including psychotherapy, medication management, or intense outpatient programs (AACAP, 2019).

**Significance**

Traditionally, screening is a preventive strategy that helps detect illness in individuals who currently have no sign or symptom of a disease. This measure assumes that early detection of the disease will help facilitate earlier and more efficient intervention. Unlike medical illness, depression screening consists of a set of questionnaires that helps identify symptoms in those whose symptoms have not yet been recognized by PCPs or where treatment has not yet been sought. The screening can then alert providers to assess the described symptoms further and initiate treatment if clinically significant. Thus, for the routine screening to be successful, it must be able to identify a vast number of adolescents who have not yet been diagnosed with depression, promote individuals to engage in treatment promptly, and obtain positive results from recommended treatment given to justify potential harm of screening and associated cost (Forman-Hoffman et al., 2016).

In 1997, the American Medical Association (AMA) was one of the first organizations to recognize a lack of mental health screening in adolescents as a gap in PC (Knishkowy, 1997). A decade later, the AACAP recommended for PCPs to start screening adolescents for depression only if signs and symptoms of the depressive disorder such as irritability, anhedonia, and depressed mood were present (Birmaher & Brent, 2007). Because of the continuous rise of teen
depression, the United States Preventive Services Task Force (USPSTF) updated the 2007 AACAP recommendations by advocating for annual depression screening for all adolescents (12 to 18 years of age) in PC settings regardless of symptom presentation. The screenings were only to take place if appropriate intervention and follow-up were available at the PC settings (Forman-Hoffman et al., 2016). The last updated guideline by the American Academy of Pediatrics (AAP) continues to support USPSTF’s latest recommendations with the addition of frequent screening for those with increased risk factors (Zuckerbrot et al., 2018). The rapidly evolving support for annual depression screening has become more prevalent as research studies show a 20% to 25% risk reduction in locations where timely screening and treatment have been initiated (Forman-Hoffman et al., 2016).

Systemic reviews, research studies, and QI measures made by AAP, the USPSTF, and the AACAP have repeatedly supported the use of regular depression screening over the years. An ideal screening tool is to be brief, easy to score, and self-administered. The screening tool should also be able to detect changes in depression scores to help adjust treatment and optimize the outcome in short follow-up sessions. Though various tools can measure depression, only a few have robust evidence to be sensitive to change. One example comprises of the patient health questionnaire (PHQ-9) screening. Sensitivity is the ability of the screening tool to detect true positive, while specificity is the ability to detect true negative (Trevethan, 2017). Evidence-based (EB) data has shown that PHQ-9 screening sensitivity and specificity ranges anywhere from 88% to 92%, respectively (APA, 2020; Levis et al., 2018; Mueller et al., 2019). The ability of the PHQ-9 to be sensitive to change is imperative as it can help monitor change from the effects of treatment. Monitoring change is an essential element of measurement-based care (MBC), which
is defined as a systemic collection of patient data to measure an individual’s progress (Scott & Lewis, 2015).

Routine progress and outcome monitoring are a crucial element of EB practice. High quality research has demonstrated that adding MBC to practice can significantly improve the patient’s overall outcome (Scott & Lewis, 2015). Utilizing the MBC model, advanced practice registered nurses (APRNs) can facilitate collaborative care amongst various team members across the organization by actively communicating and monitoring patient’s progress throughout treatment. The APRN can also use MBC to communicate with patients regarding the plan of care, progress, and treatment outcome. Youths who are actively involved in one’s own treatment have shown to demonstrate a faster recovery from symptoms than those who did not (Scott & Lewis, 2015). The APRNs can also use the MBC as a tool to help identify the target for symptom treatment, make a differential diagnosis, and measure symptom severity. Though routine depression screening in PC is highly encouraged by the AAP, the USPSTF, and the AACAP, the optimal frequency of screening has not yet been identified. Utilizing the MBC model, APRNs can publish literature regarding the incorporation of systematic measurement to help determine the appropriate frequency rate that is optimal for screening.

The high prevalence of chronic illness, the rapidly growing population, and the enactment of the Affordable Care Act (ACA) have led to an upsurge in demand for APRNs in PC settings. By utilizing a holistic model of care, APRNs can play a significant role in shaping the quality of care and healing relationship in healthcare settings. A holistic model of care is defined as a system of evaluation that views an individual as a unity of mental, emotional, spiritual, social, and intellectual essence (Roman, 2018). Thus, by integrating mental health care into PC settings,
APRNs can help reduce all holistic aspects of the adverse social outcomes that are associated with unresolved depression, such as an increase in substance abuse, unemployment, and an increase in criminal activities (Suryavanshi & Yang, 2016). Timely screening and early intervention for symptomatic adolescents can also substantially enhance adolescent’s quality of life by improving academic performance, social accomplishments, and maintenance of good relationships with significant others. Lastly, APRNs can contribute to EB practice by conducting regular research studies to influence policymakers in enforcing mandatory adolescent depression screening at local, state, and national levels.

Local Problem

Texas currently faces various mental health issues, one of its most alarming being a rise in teen depression and suicide. Among adolescents in Texas, ages 12 to 17, the annual average percentage of major depressive episodes (MDEs) has rapidly increased between the years 2004 to 2008 and 2013 to 2020 (Substance Abuse and Mental Health Service Administration [SAMHSA], 2017; America’s Health Rankings, 2020). The rapid change of MDEs for years 2004 to 2008, and 2013 to 2017 can be seen in Figure 1 below. According to the most recent survey, 34% of high school students in Texas report feeling sad for two or more weeks every day compared to 31% nationally (United States Department of Health and Human Services [USDHHS], 2020). Additionally, 5% of high school students in Texas report attempting suicide within the past 12 months as opposed to 2% of high school students nationally (USDHHS, 2020).
Figure 1


![Chart showing annual average percentage changes in past-year major depressive episodes among adolescents ages 12-17 in Texas, Region 6, and the United States.]

Note. Texas's annual average of MDEs in Texas was 11.6%, which is similar to both region R6 and the national average (SAMHSA, 2017).

Suicide is a significant public health problem that has rapidly become a leading problem in Texas. Within the past three years (2017-2020) teen suicide in Texas has increased by 28% (America’s Health Rankings, 2020), causing suicide to become the second leading cause of death in youths 10 to 24 (Suicide & Crisis Center of North Texas [SCCNT], 2020). Additionally, the
suicide rate for adolescents in Texas is 0.6% higher than the national average. This different rate of suicide in Texas and the U.S. can be seen below in Figure 2. Suicide is highest among Caucasian ethnicity in Texas, with Asian/Pacific Islanders and Hispanics having the second and third highest rates of suicide respectively (America’s Health Rankings, 2020).

**Figure 2**

*Number of Deaths by Suicide per 100,000 Adolescents Ages 15 to 19*

*Note.* Texas death by suicide is slightly higher than the national rate (America’s Health Rankings, 2020).

From 2013 to 2017, 34.1% (or 91,000) of adolescents 12 to 17 years of age received some form of treatment for their MDEs in the state of Texas (SAMHSA, 2017). Unfortunately,
the percentage of adolescents who did receive treatment for MDEs in Texas is lower than the national average (40.3%) seen in Figure 3 (SAMHSA, 2017). When looking specifically at El Paso, Texas, 13,000 adolescents are estimated to be at risk for mental health disturbance or currently eligible for some form of mental health services (MHS) (TriWest, 2014). Nevertheless, only 5,000 of the individuals are estimated to be able to receive or access the MHS needed (TriWest, 2014). Additionally, out of 30 major organization in El Paso, six serve MHS to the population of all ages (including adolescents), three offer MHS only to children and adolescents, six serve MHS to some subset of children and adolescents, and three serve MHS to children who are three to 22 years of age (University of Texas at El Paso, 2008; TriWest, 2014). Moreover, for the adults and adolescents who do seek MHS in El Paso, approximately 2% or 429 individuals are turned away (University of Texas at El Paso, 2008). This significant lack of MHS for children and adolescents in El Paso may be related to a lack of funding, service availability, and service capacity. The content of the data that is presented about El Paso was gathered from published sources dating anywhere between 2008 and 2014. No updated data was found that ranged within the last five years. Lack of data shows that insufficient attention has been paid regarding adolescent MHS, making this subject imperative to address in this QI project.
Figure 3

Number of Youths 12-17 Who Received Treatment for Their Major Depressive Episodes in Texas, Region 6, and the United States from Years 2013–2017

Note. 34.1% of adolescents 12-17 receive treatment for major depressive episodes compared to 40.3% of adolescents nationally (SAMHSA, 2017).

Needs Assessment

Despite the rise in teen suicide and depression, Texas continues to struggle with improving access to primary, secondary, and tertiary mental health treatment prevention programs. According to Mental Health America (2018), Texas ranks as the sixth lowest state in the nation with access to MHS for youths who suffer from MDE or suicide. This is because 63.1% (or 6 out of 10) of youths who suffer from MDEs do not receive the mental health
treatment needed to support their needs (Mental Health America, 2018). Additionally, mental health programs that are necessary for community-based treatments are often underfunded. Such deficit may be related to state-level budget cuts that have created a challenge for federal programs to increase MHS for youths. It is thus imperative for PCPs to become comfortable with utilizing depression screenings, formulating a diagnosis, initiating timely treatment, and following recommended guidelines in PC practice as opposed to mental health programs. There are many clinical practice guidelines available to help PCPs overcome the challenge of time and insecurity, with the AAP releasing the most up to date guideline (Zuckerbrot et al., 2018). If PCPs learn about the availability of screening tools, guidelines, and treatment options and incorporate them into practice, adolescents can experience an overall better health outcome in both the short and long term (Kilbourne et al., 2018).

**Project Purpose and PICO Question**

Over the last decade, the AAP has provided education and tools to PCPs supporting efforts to enhance depression screening, initiation of care, and the making of referrals. There is currently a knowledge gap about how education can change providers’ intent to use depression screening among youths in PC settings. While current literature strongly recommends annual depression screening, data regarding the optimal rate and outcome of routine screening remains significantly low (Harder et al., 2019). The primary purpose of this QI project, therefore, is to expand the provider’s knowledge of and intent to change behavior in administering the PHQ-9 screening to help identify, diagnose, and treat adolescents who suffer from depression in the PC setting. By completing the project, the researcher will ultimately highlight the impact of this project implementation on the provider’s knowledge and intent to change.
A well-defined PICO question helps professionals to find the best EB data available to influence current practice (Bonnel & Smith, 2018). PICO is specific to clinical issues covering five components: population, intervention, comparison, outcome, and time frame, if appropriate. Because PHQ-9 screening has shown to be most effective in identifying depressed youths, the PICO question will go as follows: “Does an evidence-based educational session on PHQ-9 screening guidelines increase provider's knowledge and intent to change regarding screening for depressed youths in PC settings?”

**Project Aims**

The primary aim of this DNP project is to enhance the PCP’s use of PHQ-9 screening to help better identify, diagnose, and treat adolescents that suffer from depression. A QI project cannot improve without a precise aim (Institute for Healthcare Improvement [IHI], 2019a). In this project, four aim statements are identified to ensure the efficiency and success of the project. The aims go as follows:

Aim 1: Educate PCPs who voluntarily choose to participate regarding the most current EB depression and PHQ-9 screening guidelines.

Aim 2: Influence provider practice change that will promote screening for depressed youths in PC settings.

Aim 3: Measure the provider’s intent to change before and after the educational intervention.

**Theoretical Framework**

The theoretical framework that drives this project is Azjen’s theory of planned behavior (TPB), which was initially introduced in 1972 by Fishbein and Azjen. Since 1972, the TPB
model has been widely applied to the understanding, encouraging, and promoting of health behaviors such as physical activity in adolescents (Palazzo, 2017), addressing intimate partner violence (Tarzia et al., 2017), and the understanding of medication administration (Rogers et al., 2017). The model operates under the assumption that the likelihood of an individual to engage in a specific behavior (e.g., initiating PHQ-9 screening) is highly dependent on the strength of individual intent to engage. The factors that influence intent is the individual’s attitude toward behavior, the perspective of the subjective norm, and the control that the individual perceives they have over the concerning behavior (Kagee & Freeman, 2017; Fishbein & Azjen, 1972).

In the TPB model, attitude is a function of affect, value, and thinking that influences an individual’s behavior (Fishbein & Azjen, 1972). The attitude relatively relates to the degree to which the individual has a positive or negative belief regarding the behavior (Azjen, 1991). The subjective norm, on the other hand, is the social pressure in which the individual is encouraged to perform or not perform a particular behavior. That is, the subjective norm ultimately determines the expected mode of conduct in which the individual is to behave. Lastly, perceived behavior control refers to the perception of ease or difficulty of engaging in a specific behavior. Previous experience or anticipation of obstacles may cloud perceived behavior control by an individual (Fishbein & Azjen, 1972; Azjen, 1991). Together, the person’s attitude toward a behavior, subjective norms, and perceived behavioral control determine the individual’s intent to change the targeted behavior.

Utilizing the TPB as a foundational guide for this DNP project will help determine factors that can be incorporated to help change providers’ practice regarding screening for depressed youths in PC settings. Ultimately, the likelihood that individuals will engage in
behaviors depends on the individual’s intention to perform (Dewberry & Jackson, 2018). The primary purpose of this DNP project is to expand the provider’s knowledge in utilizing the PHQ-9 screening to help reduce the number of undetected depressive symptoms in adolescents. The purpose of the project will be achieved using an educational intervention. It is essential to acknowledge, however, that education alone is not enough to change the provider’s intent. Thus, a different form of influence and persuasion needs to take place for change to occur (Fishbein & Azjen, 1972).

Using the TPB model, the initial goal is to present evidence that helps change stakeholders’ beliefs regarding the main topic, such as the rapid rise in adolescent depression, associated adverse events, and the effect of lack of screening in PC settings. Azjen and Fishbein (1972) emphasized that persuasion is an aspect towards the end of an intervention where change can be measured. The more persuasive the evidence, the more likely that the stakeholders will accept the given evidence and ultimately believe it. Once accepted, the second goal is to change the stakeholder’s attitude and perspective regarding depression and initiation of PHQ-9 screening. Multiple forms of evidence that positively and negatively attributed to the belief are to be presented, such as the positive and negative aspects of conducting PHQ-9 screening. The presentation of the evidence is under the assumption that belief and attitude are highly dependent on one another (Fishbein & Azjen, 1972; Azjen 1991). If the PI, can change the stakeholder’s beliefs, then attitude is soon to follow.

It is crucial to acknowledge old and newly held beliefs that may readily interact with one another, influencing the overall strength and values of the previous beliefs (Zorrilla et al., 2019; Fishbein & Azjen, 1972). In other words, previously accepted beliefs may influence not only
acceptance but also the efficacy of the new beliefs. Thus, the display of new evidence may change beliefs and attitudes in some individuals but not in others. After a change in belief and attitude have taken place, the last goal is to influence intention. The final message designed to influence providers’ intention must be different from other information already relayed. The message can be different by providing PCPs with specific recommendations to follow (Fishbein & Azjen, 1972; Azjen, 1991). After receiving recommendations, the underlying assumption is that influential communication will lead to a change in intention and behavior. This model can be viewed below in Figure 4.

Figure 4

Azjen’s Theory of Planned Behavior
Literature Review

A current review of evidence is imperative as it helps emphasize the importance of increasing PCPs’ knowledge regarding adolescent PHQ-9 screening. A literature search for current (published<5 years ago), peer-reviewed articles was conducted via the University of Arizona Health Science online library from February 2 to February 8 of 2020. These databases searches were conducted via PubMed, CINAHL, PsychINFO, and Embase. The following search terms were used to locate articles specific to this QI topic: “adolescent,” “depression,” “PHQ-9,” and “primary care.”

Using the PubMed advanced search tool, the key terms “adolescent,” “depression,” “PHQ-9,” and “primary care” yielded 2077 results. The search was further narrowed down to “full text,” “humans,” “publication date from 2015 to 2020,” “peer-reviewed/scholarly resources,” “English,” “adolescents,” and “articles” which caused the number of articles to narrow down to 30. At least 30 articles were reviewed. Some 27 of the articles were eliminated as three were inconclusive (no results or data analysis available), three were specific to adults, and 21 were related PHQ-9 screening conducted in a subspecialty setting and not in the PC setting. The exclusions resulted in three articles selected (Aalsma et al., 2018; Roseman et al., 2016; Godmoski et al., 2015).

Using the CINAHL advanced search tool, the key terms “adolescent,” “depression,” “PHQ-9 screening,” and “primary care,” yielded three articles that were from the years 2016 to 2020. The articles remaining were all academic journals, peer-reviewed, and specific to adolescents. The three articles were reviewed, but one was excluded, as the result of the research
was unavailable. The remaining two articles were added to the literature appraisal (Bhatta et al., 2018; Lewandowski et al., 2016).

Using the PsychINFO advanced search tool, the key terms “adolescent,” “depression,” “PHQ-9 screening,” and “primary care” yielded a total of 10 articles. The search was further narrowed down to “2015 to 2020” and ages “13 to 17,” narrowing articles to two. One article was a duplicate from the previous search and was therefore excluded. The remaining article was maintained for the literature review (Sinclair-McBride et al., 2018). A second search was conducted using the terms “adolescents,” “depressive disorder,” “primary health care,” and “PHQ-9,” which initially yielded 46 articles. The search was further narrowed to years “2015 to 2018,” which reduced the number of articles to 11. Two articles were eliminated as they were duplicates from the previous search, seven were eliminated as they targeted adults and adolescents. The last two articles were chosen to be reviewed as they were appropriate for this search (Osok et al., 2018 & Levis et al., 2018).

Using the Embase advanced search tool, the key terms “adolescent,” “depression,” “PHQ-9 screening,” and “primary care” yielded 25 articles. The search was further reduced to “adolescents,” publication “2015 to 2020,” publication type “article,” study “human,” which decreased the number of articles to 21, which were reviewed. Two articles were excluded as they were not research-based, seven were removed due to their focus on PHQ-9 screening in adults, one was a duplicate from previous searches, nine articles were eliminated as they were trials, and one was excluded as it was specific to deaf adolescents. The remaining article was used for the literature review (Shippee et al., 2018).
Lastly, using the AAP web base, an advanced search was conducted using the key terms “guidelines for adolescent depression in primary care” and “preparation, identification, assessment, and initial management” with the year “2018.” One article was found and used in the literature review (Zuckerbrodt et al., 2018). Overall a total of 10 articles were chosen for the final literature review. Please view Figure 5 below for the inclusion and exclusion process of the articles, and view Appendix G for the extensive review of the literature.

**Figure 5**

*Literature Review PRISMA Flow Diagram*
Synthesis of Evidence

The analysis of evidence showed that PHQ-9 screening has an overall high diagnostic accuracy, validity, and reliability in detecting depression among adolescents (Roseman et al., 2016; Bhatta et al., 2018; Aalsma et al., 2018; Zuckerbrot et al., 2018). Since the global rise in teen suicide and depression, various studies are evaluating the effect of regular PHQ-9 screening on adolescent outcomes. Regular PHQ-9 screening in PC settings has been shown to significantly improve adolescents’ outcomes in terms of treatment and diagnosis (Lewandowski et al., 2016). Regular screening is especially crucial in the adolescent population who struggle with chronic illnesses, pregnancy, homelessness, lack of social support system, abuse, and low socioeconomic status (Osok et al., 2018). Improving provider’s compliance with depression screening is thus a crucial step in promoting adolescent’s mental health in the PC setting (Sinclair-McBride et al., 2018; Levis et al., 2018; Godmoski et al., 2015; Zuckerbrot et al., 2018; Shippee et al., 2018). A description of the three emerging themes of the studies is discussed below.

Clinical Decision Support System

To incorporate adolescents’ mental health and promote daily practicability, integration of PHQ-9 within a clinical decision support system (CDSS) has shown significant efficacy in identification and diagnosis of undetected depression (Aalsama et al. 2018; Sinclair-McBride et al. 2018; Godmoski et al., 2015). Firstly, when a patient checks into a clinic, the CDSS automatically uses an algorithm to calculate the patient’s age, risk factor, medication, comorbidity, and previous PHQ-9 screening. If no previous PHQ-9 screening is detected, a screening will automatically initiate for adolescents 12 to 20 years of age (Aalsama et al. 2018;
Sinclair-McBride et al. 2018). The PHQ-9 screening is given to the patient to complete on an electronic tablet before meeting with the provider (Aalsma et al. 2018). Depending on the PHQ-9 score, multiple prompts are initiated, guiding physicians to make the appropriate decision based on clinical judgment and the most updated AAP-PC guidelines. In Aalsma et al. (2018), such use was found to enhance compliance of depression screening, promote re-administration of the screening, and increased providers’ decision making of diagnosis and initiation of treatment such as selective serotonin reuptake inhibitors when appropriate. Integrating mental health into an adolescent’s comprehensive annual visit was also effective in promoting psychosocial dialogue, psychosocial education, and depression identification (Godmoski et al., 2015).

Structured versus Semi-Structured Interviews

When an adolescent PHQ-9 score is above 10, a follow-up interview must take place to evaluate the severity of the symptoms that may or may not be related to depression (Zuckerbrot et al., 2018). A semi-structured interview is guided by the provider’s clinical judgment, while a fully-structured interview follows a scripted list of questionnaires to help determine the severity of symptoms (Levis et al., 2018). Levis et al. (2018), to measure diagnostic accuracy between the two types of interviews, conducted a 2018 meta-analysis review. Those who followed the semi-structured interview guidelines were significantly more likely to diagnose adolescents with depression correctly than those who used the scripted interview (Levis et al., 2018). The data shows that even though standardized questions are known for being more reliable, they generally are not as the screenings remove the provider’s judgment from the overall equation. Additionally, adolescents with low-level depression are more likely to be labeled as more severe in a fully structured interview as opposed to a semi-structured interview (Levis et al., 2018).
Roseman et al. (2016) also found screening to over-diagnose adolescents with depression and thus overconsume healthcare resources when it may not be necessary. To conclude, screening questionnaires alone do not help diagnose patients with depression. PCPs, therefore, should use their knowledge and judgment in addition to screening tools to identify, diagnose, and treat depression when it is appropriate (Roseman et al., 2016; Levis et al., 2018).

**Collaborative Care**

Collaborative care is an EB model that attempts to integrate mental health services into PC settings. Providers found collaborative care both feasible and cost-effective in terms of identification, evaluation, and management of depression when referral services are out of reach, such as in rural settings (Zuckerbrot et al., 2018; Shippee et al., 2018). Simply put, providing PCPs with relevant information and instructions is not enough to change provider’s behavior (Zuckerbrot et al., 2018). When a collaborative care is developed, however, the ability to deliver care with rapid access to consultation, referral options, and education significantly increases. Consultation and collaboration among various facilities not only promotes the availability of providers, but it also decreases the number of inappropriate referrals. Additionally, collaboration among school districts, healthcare providers, and PC clinics help enhance health outcomes by identifying adolescents who are at risk for developing depression and referring those affected to appropriate care (Bhatta et al., 2018). Collaborative care is ultimately team-driven, EB, measurement-focused, and population-focused, and has been shown to enhance mood within six months of care and significantly increase remission rate from 29% to 31% (Shippee et al., 2018).
Strengths of Evidence Synthesized

Multiple strengths are evident from the articles selected. Most articles were from peer-reviewed journals, increasing the high quality of the research presented. The majority of the articles selected were published between years 2018 and 2020, providing the readers with the most up-to-date EB data (Aalsama et al., 2018; Bhatta et al., 2018; Sinclair-McBride et al., 2018; Levis et al., 2018; Zuckerbrot et al., 2018). The studies strictly target the youth population within the PC setting making the data appropriate to apply strictly to pediatric primary care. Additionally, the level of evidence for most articles ranged from moderate to high, providing readers with precise, consistent data in various settings of practice.

The studies altogether confirmed the validity, reliability, and efficacy of the PHQ-9 screening (Aalsama et al., 2018; Roseman et al., 2016; Lewandowski et al., 2016; Bhatta et al., 2018; Sinclair-McBride et al., 2018; Levis et al., 2018; Zuckerbrot et al., 2018). Though lack of screening is a significant issue in PC, it is clear that PHQ-9 screening alone is not sufficient to improve mental health outcomes within the adolescent population (Sinclair-McBride et al., 2018; Levis et al., 2018; Shippee et al., 2018; Zuckerbrot et al., 2018). Even though many interventions may be underway, incorporation of PHQ-9 into CDSS, conducting structured interviews to evaluate the problem further, and using the collaborative care model to enhance quality care, have been demonstrated to promote provider’s compliance. Overall, multiple interventions need to be in place to enhance the overall depression screening, diagnosis, and management of depression in adolescents.
Weaknesses

Although the studies required adolescents to complete the PHQ-9 screening individually, they cannot confirm or deny whether the adolescents solely completed the screening as oppose to parents (Roseman, 2018). Additionally, not all studies were randomized, increasing the risk of bias for the effective interventions and treatments used (Shippee et al., 2018). A significant methodological concern also comes from the small sample size and the inability to entirely exclude patients with previous diagnosis of depression (Roseman et al., 2016; Levis et al., 2018). Lastly the reliability and validity of the PHQ-9 screening has shown to vary across different settings. These weaknesses overall increase the risk of bias and place the overall validity and reliability of the studies in jeopardy.

Gaps

Depression in adolescents is rapidly rising worldwide, yet there is a substantial lack of evidence available supporting the incorporation of depression screening in PC settings. Various studies have shown that early screening significantly improves health care outcome yet the long-term outcome of such interventions have not yet been studied (Bhatta et al., 2018; Godmoski et al., 2015; Shippee et al., 2018). Though PHQ-9 screening is imperative in identifying underlying depression, the overall impact of the interventions on depression, and the suicide rate in adolescents remains unclear. For instance, it is unclear whether effective interventions were continued after the study. If so, what were the long-term effects versus the short term? Lastly, the cost or the adverse outcome of the studies were not discussed at all.
Limitations

CDSS incorporation, semi-structured interview, and collaborative care have been found to be effective individually in improving provider’s compliance, therapeutic outcomes, diagnostic efficacy, and quality of care (Aalsama et al. 2018; Sinclair-McBride et al. 2018; Godmoski et al., 2015; Levis et al., 2018; Zuckerbrot et al., 2018; Roseman et al., 2016). Yet, the number of EB articles supporting such methods in pediatric PC settings is limited. Data supporting the incorporation of depression screening in PC settings is also limited, as most studies evaluate the effects of PHQ-9 screening in emergency departments, inpatient psychiatric centers, and outpatient psychiatric clinics. Lastly, though there is a substantial number of guidelines available regarding early screening and initiation of care, limited data have treated the efficacy and usability of EB guidelines within the clinical practice (Zuckerbrot et al., 2018).

METHODOLOGY

Project Design

This DNP project design consists of a pretest-posttest quantitative design. An EB educational intervention was conducted using an asynchronous learning format, discussing current recommendations for adolescent depression screening, and the importance of conducting PHQ-9 screening in the PC setting. Qualtrics was used as a tool to distribute questionnaires, collect pretest-posttest forms, and analyze concluding data. The pretest-posttest questionnaires were distributed to the medical doctors (MDs), nurse practitioners (NPs), physician assistants (PAs), and doctors of osteopathy (DOs). The pretest questionnaires were expected to be completed before the educational intervention and the posttest questionnaires after (Bonnel & Smith, 2018). The framework that was utilized to guide this educational intervention is known as
the model for improvement (MFI) (IHI, 2020). The pretest-posttest measurements helped gauge the presentation's effectiveness in enhancing the providers’ knowledge and intent to change.

**Model for Improvement**

The MFI (IHI, 2020) begins with three fundamental questions: 1) What is the organization attempting to accomplish? 2) What tools can be used to measure change? 3) What changes can be made that will result in an optimal outcome? These questions guided the principal investigator (PI) to set measurable aims for the proposed accomplishment, identify the variable or changes that are recognized as improvement factors, and select the interventions that would result in the best outcome (IHI, 2020). The questions are then soon followed by the plan-do-study-act (PDSA) cycle, which quickly plans, tests, analyzes, and refines the changes until the desired outcome is reached (IHI, 2020). The three fundamental questions and the four critical stages of the PDSA cycle pertinent to this DNP project can be viewed in Appendix H.

The goal of this DNP project was to educate PCPs about the most current EB depression and PHQ-9 screening guidelines set by the AAP in 2018. The aim was set to be completed seven days after the induction of education, with a goal of a 20% positive pretest-posttest increment increase. The next step was to choose an appropriate measure to monitor the changes that would lead to the desired outcome. Providers’ objective knowledge regarding adolescent depression screening before and after the educational intervention was measured using a pretest-posttest questionnaire method. Additionally, the intention of change, behavioral control, attitude, and belief was measured using the Likert scale with response options ranging from strongly agree to strongly disagree (Krabb, 2017). Evaluation of the outcome measures ultimately determined whether to adapt, adopt, or discard the tested educational intervention (IHI, 2020). Lastly, the
MFI required developing a change concept that would increase the provider’s intent to administer the PHQ-9 screening. For this project, an EB educational presentation took place to change intent, attitude, and knowledge regarding the screening tool. The PDSA cycle was used to test the change’s efficacy as the aim, outcome measure, and change concepts were determined (IHI, 2020).

**Plan**

The PI predicted that an EB educational presentation would further enhance PCPs’ knowledge and intent to change behavior in administering the PHQ-9 screening among youths in PC settings. Overall, the educational sessions were conducted at one family medicine clinic in El Paso, Texas, from August 3 to August 7 of 2020. The education was delivered using Panopto and released to participants via email. Additionally, Qualtrics was used to collect the data of the pretest-posttest questionnaires. The asynchronous learning format gave participants the possibility to complete education at a time that was most convenient to them (Biech, 2015). This form of learning was especially important since the project was being conducted during the coronavirus disease (COVID-19) pandemic crisis, where PCPs’ time for educational learning was limited. The targeted participants consisted of adults ages 18 and older who were PCPs and actively involved in implementing and disseminating PHQ-9 screenings. Thus, the target participant group for this QI project consisted of MDs, DOs, NPs, and PAs. The overall educational session was no more than 20 minutes. The anticipated cost of education was $0, as the intervention was completed solely online.
Do

The second portion of the PDSA required the PI to implement the educational intervention using an asynchronous learning format. Initially, PCPs received a full disclosure statement describing the purpose of the QI project and the risk-benefit ratio associated with the study. The pretest questionnaire was implemented, followed by the recoded educational session, and then posttest questionnaires, once the educational session was completed. The participants initially had to fill in a voluntary agreement form, located at the beginning of the pretest-posttest questionnaire for convenience. The form ensured that PCPs knew that participating in the study was voluntary, with no foreseen risks. The participants were also asked to complete a pretest-posttest questionnaire before and after the educational session, respectively. The pretest-posttest questionnaires’ total time was five minutes each, and the total time for the presentation was 15 minutes. Overall, the educational session took no more than 25 minutes total to complete. The participants were given seven days to complete the asynchronous learning and assigned questionnaires. Once completed, participants were to click submit, at which point data was collected.

Study

Once the questionnaires and the educational session had taken place, a descriptive analysis was undertaken to evaluate the results and determine the overall conclusion (IHI, 2020). The objective knowledge of the PCPs was analyzed by calculating the percentage of those who correctly responded to the questionnaires. The Likert-based questions were analyzed using a bar graph. A comparison of pre- and post-survey data can be found in the final narrative.
Act

Once data analysis had been completed, a conclusion was made about whether to adapt, adopt, or discard the changes that had been tested (IHI, 2020). After multiple adjustments to the PDSA, the overall goal is to make recommendations, in which positive changes will gradually become permanent for enhanced quality of care at the chosen local site (IHI, 2020). Due to the time constraint for this QI project, however, only one PDSA cycle was completed. Please refer to Appendix H for more details about the PDSA cycle.

Setting

The QI project took place in El Paso, Texas, in El Paso County, with an estimated 682,686 residents (Data USA, 2020). Though nine other counties are adjacent to El Paso (Dona Ana, Otero, Hudspeth, Guadalupe, Juarez, Praxedis, Cass, Nacogdoches, & San Augustine), El Paso County continues to be the largest and westernmost county of them all (Data USA, 2020). The population of El Paso is mostly Hispanic (82%), followed by Caucasian and African American (Data USA, 2020). The overall distribution of ethnicity in El Paso can be viewed below in Figure 6. Currently, El Paso has 20.3% of individuals who live below the poverty level, with females aged 25 to 34 being affected the most, followed by females 18 to 24 years of age (Data USA, 2020).
The designated educational session in El Paso was presented to employees who worked at the Texas Tech Health Science Center (TTUHSC) within the family and community medicine department. The TTUHSC is located centrally, in what is considered the urban part of the town (Google Maps, 2020). The clinic serves both pediatric and adult patients anywhere from early childhood to late adulthood (TTUHSC, 2020). The TTUHSC School of Medicine was established in 1969 in El Paso, Lubbock, Amarillo, and Odessa (TTUHSC, 2020). Over the years, the nursing school, the school of biomedical science, and the school of dental medicine began to follow with the mission to address the social and cultural needs of the diverse border population (TTUHSC, 2020). The TTUHSC in El Paso is the only health science center located along the US and Mexican border that provides interpersonal exchange among different health professional students (TTUHSC, 2020). The goal of the TTUHSC is to enhance students’

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**Figure 6**

*El Paso, Texas Ethnicity*

Note. The most updated data of El Paso, Texas ethnicity from 2018 (Data USA, 2020).
knowledge, engagement in high-quality research and high-quality care. The family and community clinic offer services such as wellness exams, immunizations, developmental screening, low acuity behavioral health issues, and diagnosis of acute and chronic illnesses (TTUHSC, 2020; American Academy of Family Physician [AAFP], 2020b). If acute mental health problems begin to escalate in this health science center, such as acute depression with psychosis, mental health referrals are made to local community resources.

**Stakeholders**

For the DNP project to be successful, a diverse group of stakeholders would not only help manage resisters and supporters of the change but also help gain political buy-in for potential impact (Silver et al., 2016; Leviton & Melichar, 2016). According to IHI (2019b), an effective team has three forms of leaders: a day-to-day leader, someone with technical expertise, and a system leader. The driver of the QI project was the day-to-day leader, who promoted the plan that asynchronous learning would be disseminated to eligible providers in a timely manner (IHI, 2019b). The day-to-day leaders recognized were the charge nurse, front desk staff, and medical assistants. Technical expertise consisted of a professional who was well acquainted with the QI project and was comfortable to assist in designing practical measuring tools, providing guidance in collecting data, and interpreting the data once collection was completed. This leader was the PI who implemented and guided this project. Lastly, the system leader is typically an authoritative individual who can implement the proposed change and effectively address the consequences of the effected change (IHI, 2019b). In this study, this leader was the medical director who ran the department of family and community medicine in TTUHSC. The system
leader helped reduce barriers that arose and strategized ways to overcome them when the change was in transition.

A diverse number of stakeholders and leaders was selected due to the unique contribution of cultures, values, and goals that each member brought to the healthcare community (Pepin et al., 2016). A significant benefit of using a multi-stakeholder approach was the creation of a shared roadmap in reducing adolescent depression within the local community. The reduction in depression rates among adolescents would be achieved by acknowledging the need to enhance depression screening, improve diagnosis, and manage depression in a prompt manner. On the other hand, the various risk factors foreseen for this project were the stakeholders’ lack of interest, time, and guidance, all of which could have ultimately prevented the participants’ successful engagement during the educational session (Pepin et al., 2016).

**Intervention**

Before initiating the QI project, the PI initially spoke with the clinic’s medical director of the TTUHSC to discuss the issues surrounding the PC setting. Both the PI and the medical director agreed to the QI project that ultimately will encourage the use and initiation of PHQ-9 screening in the PC setting. The exact timeline of meetings can be viewed in Appendix F. Once the University of Arizona and the Institutional Review Board (IRB) approved the QI project (Appendix A), the PI sent a flyer to the PCPs via email, inviting them to participate in a voluntary QI study during August 3 to August 10 of 2020 (Appendix C). The flyer was sent via administrator’s email. The participants were directed to participate by contacting the PI via email, text, or phone call provided in the flyer. The PI requested the participants to share their personal or professional emails to facilitate communication. Once individuals were verified as
meeting the inclusion criteria, three emails were sent by the PI to participants starting two weeks before the educational session to bring awareness to the planned intervention (Appendix C). The initial email included a disclosure form, the QI project’s objective, and date of implementation, time to complete education, contact number, and a contact email to express interest in participating in the study. The second email included the disclosure form, Panopto video, pretest-posttest questionnaire link, and instructions for how to open the asynchronous video. The third email was sent to remind participants to complete the intervention three days before the Panopto educational intervention, and that the pretest-posttest material would become inaccessible as the materials would only be available for a period of seven days. The disclosure form, the recruitment flyers, the overall instructions, and the survey reminder email can be viewed in Appendices B, C, and E respectively.

Before implementing this QI project, the DNP committee chair member, Dr. Edmund, conducted an expert review on the questionnaires and the PowerPoint presentation. Conducting an expert review is a valuable method to incorporate to help uncover usability issues that may have been initially missed by the PI (Harley, 2018). Once the expert review was completed, the initial steps for the QI project began. The overall intervention for this DNP project consisted of a 15-minute recorded education session that addressed the rapid rise in teen depression, risk factors, prevalence, adverse outcomes, and screening recommendations that followed the AAP screening guidelines. The educational intervention for the TTUHSC Clinic was electronically implemented on Monday, August 3, 2020, at 8:00 AM. The participants were given a total of seven days to complete the 15-minute lecture and the 10-minutes needed for the pretest-posttest questionnaires, respectively. In the email, the participants were given clear directions to take five
minutes to complete the pretest questionnaire initially. Once questionnaires were completed, the participants were directed to start the 15-minute Panopto video. The PowerPoint slides were shared with the audience during the recorded lecture to help facilitate learning. During the introduction, the participants were reminded that the educational session was voluntary, and the participants could choose not to fill in the pretest-posttest questionnaires. Following previous recommendations for maintaining an audience’s interest (NCSL, 2020) the presentation was kept to a maximum of 18 slides, with simple designs and minimal wording.

The educational session began by discussing the objectives and the goal for this presentation. The resources used to inform the education content were derived from EB resources. Using the TPB model as a guide, the initial evidence presented covered the rise in teen depression, the risk factors associated with depression, and the statistical data that supported the rise in teen suicide both nationally and locally. The goal of the initial data was to bring awareness to the gravity of the issue and the ongoing problems associated with it (Fishbein & Azjen, 1972; Azjen, 1991). Next, the significance of depression screening, indication for screening, and the AAP's recommended guidelines were discussed. The information was given to help change participants’ attitudes toward the importance of initiating screening. Lastly, the PI briefly discussed how PHQ-9 screening could help reduce the number of adverse outcomes associated with depression in everyday society. The education session was concluded by leaving providers with specific recommendations to increase the provider’s intent to screen (Dewberry & Jackson, 2018). At the end of the presentation, the references were shared with the audience, and participants were instructed to send any questions directly to the PI via email for further clarification. The PI was prepared to respond to question and concerns within 48 hours of initial
contact. The participants were then reminded to take five minutes to complete the posttest questionnaire by clicking the link sent to them via email. The participants were reminded that the educational intervention was voluntary, and that they could choose not to fill out the posttest questionnaires. Once they completed the questionnaires if they chose to do so, participants were to click submit, and all data would be collected. Prior to implementation, the barrier foreseen was the minimal number of PCPs that may choose to participate in the QI project. This minimal participation was deemed to be related to the lack of time associated with the COVID-19 pandemic. The PI worked to overcome this barrier by promoting education through the asynchronous learning format, sending reminder emails to eligible participants, and extending education completion to seven days.

**Participants and Recruitment**

The participants recruited consisted of MDs, DOs, NPs, and PAs that were located at the TTUHSC Clinic in El Paso, Texas. Inclusion criteria consisted of: (a) being actively employed or assigned to the TTUHSC Clinic; (b) having direct contact with adolescents 12 to 18 years of age and their families; (c) playing a role in implementing PHQ-9 screening to the adolescents 12 to 18 years of age and their families; (d) being above 18 years of age; (e) voluntarily consenting to participate in the QI without any form of coercion being placed by the company or PI; (f) having English as a primary language; (g) having access to a computer; and, (h) residing in El Paso, Texas. Exclusion criteria included anyone who: (a) was not actively employed or assigned to the TTUHSC Clinic; (b) had no direct contact with adolescents 12 to 18 years of age or their family members; (c) had no active role in implementing or distributing the PHQ-9 screening; (d) was less than 18 years of age; (e) had a primary language that is not English; (f) had no access to a
computer; and, (g) did not live in El Paso, Texas. The goal was to recruit a minimum of 15 providers.

The PI recruited participants by working with convenience samples of passionate early adopters from the TTUHSC Clinic (Etchells & Woodcock, 2017). As mentioned above, three emails were sent starting two weeks before the educational session in order to bring awareness to the planned intervention. The initial email included the disclosure form, the objective of the QI project, date of implementation, time to complete education, contact number, and a contact email to express interest in participating in the study. The second email included the disclosure form, Panopto video, pretest-posttest questionnaire, and instructions for how to open the asynchronous video. The third email was sent to remind participants to complete the intervention three days before the Panopto video and pretest-posttest questionnaire intervention closed. The sample size anticipated was approximately 15 to 20 participants, which was deemed appropriate for this QI project. Having a small sample size could improve local gaps more rapidly when statistically significant results point leaders to the most effective intervention (Etchells et al., 2015). Additionally, the small number of participants is more feasible when multiple PDSA cycles are being implemented to achieve the most desired outcome. Lastly, small sample size can be useful in estimating the intervention’s effect within a small population as opposed to the entire population of the system (Etchells et al., 2015).

Consent and Ethical Considerations

Ethical oversight for the QI project was obtained from the University of Arizona College of Nursing Departmental Review Committee and the IRB. Informed consent was obtained from participants to protect participants from any risk associated with the QI project (Fiscella et al.,
The consent language, including discussion of potential risks and harms of the study, was located at the beginning of both pretest-posttest questionnaires (Appendix D).

**Respect for Human Dignity**

Participants were treated with utmost respect and dignity for the entire duration of the proposed QI project. Participants were entitled to a full disclosure that completely described the purpose of the QI project with the risk-benefit ratio associated with the study. The entire disclosure covered multiple contents, including the participant’s right to the absence of coercion and deception. Participation and response to questionnaires were voluntary. The participants had the right to refuse to participate, decline to give information, and withdraw from the educational session at any given time (Polit & Beck, 2017).

**Justice**

Inclusion and exclusion criteria that are fair and applicable to the project were implemented to maintain the ethical principle of justice. Justice was honored by only including individuals that met the inclusion criteria and exclusively benefited from the QI study (Polit & Beck, 2017). The right to privacy was maintained by placing any identifiable information into a password protected Excel sheet in a password-protected computer locked in a locked office, complying with IRB requirements. The only person who had access to the identifiable information was the PI. After the QI project was completed, the data was transferred into a password-protected cloud service of the College of Nursing at the University of Arizona. No personnel except Dr. Pasvogel will have access to the files.
Beneficence

The PI, who was qualified to conduct the QI project (Polit & Beck, 2017) completed the educational intervention. The study did not place any participant at a disadvantage as it was designed to enhance the participants’ knowledge and intent in implementing the PHQ-9 screening based on most current EB recommendations. Potential risk foreseen was participants’ the lack of confidence in self-reporting attitudes about regularly implementing and utilizing the PHQ-9 screening. To conclude, the study was designed to maximize educational benefits to participants, eventually improve adolescent health outcomes, and enhance the quality of care at the designated clinics while minimizing the risk-benefit ratio to the affected personnel (Polit & Beck, 2017).

Data Collection

The questionnaire design utilized in this DNP project was a one-group pretest-posttest quantitative design. From a methodological standpoint, collecting data from multiple points in time was imperative in evaluating the intervention’s long-term strength after it was completed (Alessandria et al., 2017). The PI utilized the AmeriHealth Caritas Louisiana education toolkit (2014) and the 2018 AAP guidelines to create the pretest-posttest questionnaires’ content. The participants were instructed to take approximately five minutes to fill out a 15-item questionnaire before and after the educational intervention, respectively. The questionnaires’ content was delivered via email that directed participants to web-based survey software, Qualtrics, for convenience. Each individual was given a personalized link that could only be utilized once. The link was set to expire after seven days. Once participants complete the questionnaires, Qualtrics automatically saved the data and allowed the PI to analyze data from the site’s location.
(Qualtrics, 2020). The data was only collected from those who met the inclusion criteria discussed above. If the participants did not meet the inclusion criteria and still filled out the questionnaires, the data was excluded during analysis. The privacy of the questionnaires was maintained by placing and transferring all identifiable information into a password protected Excel sheet in a password-protected computer locked in a locked office, per IRB requirements.

**Questionnaire Design**

Both pretest and posttest questionnaires began by collecting demographic information in five areas: age, gender, specialty, the highest degree of education, and years in practice. Five multiple-choice questions were provided regarding content covered during the presentation. Lastly, five-point Likert style questions were included that asked participants to rate their own: (1) compliance with distributing or administering the PHQ-9 screening; (2) knowledge regarding adolescent depression screening; (3) agreement or disagreement with AAP screening recommendation; (4) knowledge regarding depression risk factors; and, (5) intent to use the PHQ-9 screening in PC practice.

The reliability and validity of the questionnaires was established prior to its administration. The reliability of data collection tools refers to the consistency of measurement (Louangrath & Chanoknath, 2018). In contrast, the validity of data collection tools refers to the precision between what is being observed and what is expected (Louangrath & Chanoknath, 2018). The reliability and validity of the questionnaires by ensuring that all the questionnaire's subparts equally measure the same characteristic. The PI also ensured that the instrument covered only the content that was discussed within the educational intervention, which was
relevant to the issue at hand. Lastly, all items were peer-reviewed by committee members before use in data collection procedures.

**Data Analysis**

For the five demographic questions, categorical variables were used. One of the fundamental statistical analyses used for the categorical variable is percentages (IBM, 2020). Following Pazzaglia et al. (2016), percentages were used to summarize and analyze participants’ responses to demographic questions in a simple but efficient manner. Multiple-choice questions that followed the demographic survey were also analyzed as categorical variables. The objective knowledge of the questionnaires was scored by calculating the percentage of the population who answered the question correctly. The pretest-posttest results were compared with a 20% goal increase after the educational intervention took place. Lastly, comparisons of knowledge differences for Likert questions were displayed via bar graphs. A bar graph can allow for comparison and contrast of the Likert items’ response by ultimately demonstrating PCPs’ level of disagreement or agreement with the presented issue.

Some possible flaws can be associated with the analyzed data. For example, the number of non-responders has the potential to significantly impact results (Pazzaglia et al., 2016). To counteract this potential flaw, the PI extended the questionnaire’s duration to increase response rates. Another consideration in data analysis is known as response bias. Response bias refers to the participant’s tendency to respond to PI questions or surveys inaccurately (Polit & Beck, 2017). Responses that do not accurately reflect the understanding of participants can threaten the validity of the overall study. The PI limited response bias by providing clear instructions for the
pretest-posttest questionnaires using neutral words, ensuring that the questions or options were not misleading, and assuring that the survey remained anonymous (Mahtani et al., 2018).

RESULTS

Findings

This section presents the pretest-posttest questionnaires' data analysis results, including the demographics, multiple-choice, and the Likert-based questionnaires. The asynchronous educational intervention and the pretest-posttest survey opened on August 3 of 2020 in the TTUHSC clinic. The participants had seven days to complete the questionnaires anytime between August 3 and August 10. Once the participants completed the pretest-posttest surveys, all data was automatically collected via Qualtrics software. All data were analyzed between August 17 and September 9. Out of 13 providers invited to participate from the TTUHSC clinic, only three PCPs completed both the pretest and posttest questionnaires, leaving a response rate of 20% and a sample size of three. All three participants completed 100% of the pretest-posttest surveys. All three participants consented to participate. No participant chose to leave the educational intervention after or during the implementation process. Additionally, no adjustment to the questionnaire before or after the educational intervention was needed, based on the early response rate.

Demographics

All three individuals (N=3, 100%) who participated in the QI study completed all the pretest-posttest demographic portion of the survey. Additionally, all three (100%, N=3) participants that completed the surveys were female. Two participants (66.7%, N=2) were between the ages of 18 and 35, and one participant was between the ages of 36 and 50 (33.3%,
N=1). Nurse practitioners represented the highest number of participants (66.7%, N=2), and MD or DO represented a minority of the participants (33.3%, N=1). The degree of education varied as one PCP (33.3%, N=1) had a doctorate, one PCP (33.3%, N=1) had a master’s degree, and one PCP (33.3%, N=1) had their MD or DO degree. Lastly, two of the participants had 0 to 5 (66.7%, N=2) years of practice, and one (33.3%, N=1) participant had 6 to 10 years of practice.

The completed demographic table can be seen below in Table 1.

Table 1

**Participant Demographics**

<table>
<thead>
<tr>
<th>Gender</th>
<th>Age</th>
<th>Specialty</th>
<th>Highest Degree of Education</th>
<th>Years in Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>18-35</td>
<td>Medical Doctor or Doctor of Osteopathy</td>
<td>Medical or Doctor of Osteopathy Degree</td>
<td>0-5</td>
</tr>
<tr>
<td>100% (N=3)</td>
<td>66.7% (N=2)</td>
<td>33.3% (N=1)</td>
<td>33.3% (N=1)</td>
<td>66.7% (N=2)</td>
</tr>
<tr>
<td>Male</td>
<td>36-50</td>
<td>Physician Assistant’s Masters</td>
<td>0% (N=0)</td>
<td>0% (N=0)</td>
</tr>
<tr>
<td>0% (N=0)</td>
<td>33.3% (N=1)</td>
<td>33.3% (N=1)</td>
<td>33.3% (N=1)</td>
<td>33.3% (N=1)</td>
</tr>
<tr>
<td>Other</td>
<td>&gt;51</td>
<td>Nurse Practitioner Doctorate</td>
<td>0% (N=0)</td>
<td>0% (N=0)</td>
</tr>
<tr>
<td>0% (N=0)</td>
<td>66.7% (N=2)</td>
<td>33.3% (N=1)</td>
<td>0% (N=0)</td>
<td></td>
</tr>
</tbody>
</table>

**Preliminary Findings of Multiple-Choice Questionnaires**

All three participants (N=3, 100%) completed the pretest-posttest multiple-choice portions of the questionnaires (Appendix D). For questions 7 and 9, the three participants (N=3, 100%) responded correctly in both pre- and post-questionnaires. For questions 6 and 10, two participants (N=2, 66.7%) responded correctly before and after the designed intervention. One (N=1, 33.3%) of the participants responded incorrectly to both questions 6 and 10 before and after the designed intervention. For question 8, only one of the participants (N=1, 33.3%) responded to the question correctly in the pretest. However, after the educational intervention, all three participants (N=3, 100%) responded to question 8 accurately during the post-test survey. A
13.4% increase in correct responses was noted in the multiple-choice questionnaire after the designed implementation. Overall, the average results of the participants improved from a score of 73.3% to 86.7%. The summary of the response to questions 6 to 10 of the pretest-posttest survey can be seen in Figure 7 below.

**Figure 7**

*Percentages of Correct Answers to the Multiple-Choice Questionnaires*

![Graph showing the percentages of correct answers to questions 6 to 10 of the pretest-posttest survey.]

*Note.* This figure represents the combination of correct pretest-posttest responses from questions six to ten of the surveys.

**Preliminary Findings of Likert-Based Questionnaires**

The participants’ attitudes and beliefs were measured using questions on a five-point Likert scale (5 = strongly agree; 4 = somewhat agree; 3 = neither agree nor disagree; 2 = somewhat disagree; 1 = strongly disagree). The providers were asked to rate their level of agreement or disagreement with the following five statements: (1) I am compliant with distributing or implementing the PHQ-9 screen with adolescents 12 and older; (2) I am aware of the screening,
assessment/diagnosis, and management recommendations that are presented by the American Academy of Pediatrics; (3) I agree with the 2018 screening guidelines that has been published by the American Academy of Pediatrics; (4) I am aware of the common risk factors that are associated with depression in adolescents 12 to 18 years of age; and, (5) I have no intent to administer the PHQ-9 screening in my current practice. All three participants (N=3, 100%) ultimately finished the pretest-posttest Likert-based portion of the questionnaires.

The first Likert-based question asked PCPs to rank their compliance level with utilizing and implementing the PHQ-9 screen in their PC practice for adolescents 12 years and older. Before the educational intervention, all three PCPs (N=3, 100%) somewhat agreed that they are in compliance with utilizing the PHQ-9 screening in their practice. After the educational intervention, two (N=2, 66.7%) of the participants were in stronger agreement, and one (N=1, 33.3%) individual was somewhat in agreement with the importance of PCP’s becoming compliant with the using, distributing, and implementing of the PHQ-9 screening in their PC practice. Overall a two-point (N=2, 66.7%) increase from pretest to posttest survey was noted, with participants being in stronger agreement to utilize the PHQ-9 screening in their practice. This question’s results before and after the intervention can be seen below in Figure 8.
The second Likert-based question relates to the PCPs’ self-declared knowledge regarding the 2018 *Guidelines for Adolescent Depression in Primary Care* (GLAD-PC) published by the AAP. Before the educational intervention, three (N=3, 100%) of the providers selected ‘somewhat agree’ in response to the idea that they were knowledgeable about the GLAD-PC. After the educational implementation, two (N=2, 66.7%) of the participants selected ‘strongly agree’ with regard to becoming knowledgeable about the GLAD-PC. One (N=1, 33.3%) of the providers selected ‘somewhat agree’ to this question in the post-intervention. An overall two-point (N=2, 66.7%) increase was noted after the educational intervention, with PCPs having a stronger agreement that they understand the 2018 AAP guidelines. This question’s results before and after the intervention are seen below in Figure 9.
Figure 9

Awareness of the Publication of Guidelines for Adolescent Depression in Primary Care Recommendations by the American Academy of Pediatrics

The third Likert-based question assessed the PCPs’ level of agreement with the 2018 AAP GLAD-PC content. Before the educational intervention, two (N=2, 66.7%) of the PCPs were selected ‘somewhat agree,’ and one (N=1, 33.3%) provider selected ‘strongly agree.’ After the intervention, two (N=2, 66.7%) of the participants selected ‘strongly agree’ in response to the question regarding the 2018 AAP recommendations, and one (N=1, 33.3%) again selected ‘somewhat agree.’ An overall one-point (N=1, 33.3%) increase was noted from pretest to posttest intervention with PCPs being in stronger agreement with the GLAD-PC. This question’s results before and after the intervention are seen below in Figure 10.
The fourth Likert-based question evaluates the knowledge of PCPs regarding the common risk factors for depression in adolescents 12 years and older. Before the intervention, two (N=2, 66.7%) providers selected ‘somewhat agree’ with regard to their awareness of the common risk factors for depression in adolescents, and one (N=1, 33.3%) participant selected ‘strongly agree.’ After the intervention, two (N=2, 66.7%) participants selected ‘strongly agree’ regarding a better understanding of the common risk factors for depression, and one (N=1, 33.3%) participant selected ‘somewhat agree.’ An overall one-point (N=1, 33.3%) increase was noted from pretest to posttest intervention with PCPs becoming more aware of the common risk factors.
factors for depression in adolescents 12 years and older. This question’s results before and after the intervention are seen below in Figure 11.

**Figure 11**

*Awareness of Common Risk Factors That are Associated with Depression*

The last Likert-based question evaluates providers’ intent wanting to utilize the PHQ-9 screening in their current practice. Before the intervention, two (N=2, 66.7%) of the PCPs were in strong disagreement with having no intent to screen adolescents for depression, and one (N=1, 33.3%) selected ‘somewhat disagree’ in response to lacking the intent to screen using PHQ-9 questionnaire. After the educational intervention, all three participants (N=3, 100%) selected ‘strongly disagree’ for the question asking if they continue to have no intent to use the PHQ-9 screening in their current practice. The Likert scale question results on PCPs intent to use the PHQ-9 screening, after the educational intervention, indicated that all three (N=3, 100%) of
providers agreed to use the PHQ-9 screening tool. This question’s results before and after the intervention are seen below in Figure 12.

**Figure 12**

*Having No Intent to Use the PHQ-9 Screening in Current Practice*

<table>
<thead>
<tr>
<th>Level of Agreement</th>
<th>Pre-Test</th>
<th>Post-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Disagree</td>
<td></td>
<td>2.00</td>
</tr>
<tr>
<td>Somewhat Disagree</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Neither Agree Nor Disagree</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Somewhat Agree</td>
<td>0.00</td>
<td></td>
</tr>
<tr>
<td>Strongly Agree</td>
<td>0.00</td>
<td></td>
</tr>
</tbody>
</table>

**Scholarly Project Evaluation and Outcome**

During the evaluation of the outcomes, all individuals were given an identification number from one to three to allow participants to remain anonymous during data analysis and outcome evaluation. Each participant’s response was evaluated separately, and the results of the data were recorded in a pretest and a posttest Excel datasheet, respectively. During data evaluation, it was noted by the PI that the five-point Likert-based questions results were altered
to a six-point Likert-based question (7= strongly agree; 6= agree; 5= somewhat agree; 4= neither agree nor disagree; 3=somewhat disagree; 2=disagree; and 1= strongly disagree). Due to these alterations, all responses of ‘agree’ and ‘disagree’ were changed to ‘somewhat agree’ and ‘somewhat disagree’ respectively.

DISCUSSION

Summary

Depression continues to rapidly debilitate adolescent’s quality of life both nationally and globally, causing an increase in adverse outcomes such as substance abuse and suicide. Despite this rise, minimum attention has been given to promoting screening and preventing mental health issues in children and adolescents at the level of resource allocation, legislation, policy formulation, and the overall health care system (Petersen et al., 2016). Although numbers of EB literature support routine depression screening in adolescent’s population, there continues to be a lack of literature studying the benefits of routine depression screening in PC settings. The effect of routine depression screening on adolescent mental health is critical to evaluate because approximately 80% of adolescents with depression symptoms seek care in a PC setting and not in a mental healthcare setting (Zenlea et al., 2014; Roseman et al., 2016). Evidence-based delivery of high-quality educational content has been proven an efficient form of intervention in disseminating data to healthcare professionals (Hsieh & Chen, 2020; Albarqouni et al., 2018; Mickan et al., 2019). This QI study used a pretest-posttest quantitative study design to evaluate an educational intervention's effect on the PCPs’ knowledge and intent. The ultimate purpose of this project was to expand the knowledge of the PCPs and increase their intent to use the PHQ-9
screening to help identify, diagnose, and treat adolescents that are suffering from or are at risk for depression at the TTHSC clinic.

This QI study’s findings support the educational intervention’s efficacy on the PCPs’ knowledge and intent. An encouraging key finding was the increase in the multiple-choice questionnaires from a score of 73.3% to 86.7%. Though the goal of a 20% increase in knowledge was not reached, a total increase of 13.4% was noted in the knowledge of PCPs post-intervention. Another key finding was in the overall results of the Likert-based questions. The final results showed that a stronger agreement was found post-intervention among the following key factors: the intent of becoming compliant with distributing and implementing the PHQ-9 screening in their practice; becoming more aware of the GLAD-PC recommendation that was published by the AAP in 2018; a stronger agreement with the 2018 GLAD-PC recommendations; and an enhanced comprehension of the everyday risk factors for depression in adolescents. Lastly, the post-test survey results of the Likert scale question on PCPs intent to use the PHQ-9 screening indicated 100% of providers agreed to use the PHQ-9 after the educational intervention. In summary, an overall six-point increase for questions one to four of Likert-based questions was noted, with the PCPs being in stronger agreement with the content presented post-intervention. Furthermore, a one-point decrease was noted for the PCPs being in strong disagreement for having no intent to use the PHQ-9 screening at their current practice.

**Interpretation**

The findings complement the utilization of Azjen’s TPB model to enhance knowledge and intent to utilize the PHQ-9 screening at the TTHSC clinic to help readily identify, diagnose, and treat adolescents with depression to prevent future adverse outcomes (Fishbein & Azjen,
According to the TPB model, the likelihood of intent to change highly depends on individuals’ attitudes toward behavior, the perspective of the subjective norm, and the amount of control that the individual believes they have to change the concerning behavior (Fishbein & Azjen, 1972). The project was designed to provide PCPs with high-quality EB data to demonstrate the significance of the rise in depression and attempt to change their intent and behavior with regard to screening.

The initial step’s goal was to change the PCPs’ attitudes and beliefs regarding adolescent depression and the importance of screening. The final step’s goal was to change the PCPs’ intentions and behaviors by providing the PCPs with specific recommendations to follow, given the current high-quality EB data (Fishbein & Azjen, 1972; Azjen, 1991). This QI study’s findings are similar to the findings of previous studies that used the TPB model to change motivation, intent, and behavior of other populations. Like in this QI study, a meta-analysis published by Steinmetz et al. (2016) demonstrated that TPB-based intervention significantly impacted changing intentions of a behavioral domain in multiple studies. Additionally, Hatefnia et al. (2019) identified that change in attitude had the strongest association determining a participant’s change in intent. In conclusion, this QI study supports the previous studies findings that EB training can changing participants’ attitudes and beliefs toward a target behavior.

**Implications for Practice, Education, Research and Policy**

Altering the attitude and belief of PCP’s using EB data is a strong predictor of change in behavior and intent. Thus, the QI findings support continuing the educational intervention in the TTHSC clinic with the other PCPs’ to bring the scope of the rise in adolescent depression and suicide into perspective. Additionally, the continuation of the PDSA cycle will help promote and
sustain the routine use of PHQ-9 screening in adolescents 12 years and older to reduce the number of mental health issues in El Paso County. Once the multiple PDSA cycles are completed, and appropriate modifications are made in the TTHSC PC units, the intervention can be expanded to other health care communities to discover if the results will be more generalizable. The research team and the healthcare team should collaborate closely to enhance the PCPs’ motivations in continuing the process of routine screening of adolescents in the study. The PCPs’ involvement in further disseminating EB data can also promote the professional obligation for PCPs to address mental health issues related to children and adolescents (Mahoney et al., 2017). Policymakers to enhance the availability of EB mental health programs for children and adolescents can then use the added EB data.

Before implementing mental health programs, policymakers and healthcare clinicians need to understand the correlation between routine depression screening and mental health (Mahoney et al., 2017). Policymakers take an interest in EB data robust enough to inform resource allocation but small enough to make it generalizable to specific geographic locations (Hirschhorn et al., 2018). Once enough high-quality data has been gathered to support the advantage of routine depression screening in PC settings for adolescents, a national policy can be passed to mandate its use.

**Limitations**

A fundamental limitation for this QI study is the lack of generalizability due to QI projects’ nature, which focuses on enhancing the efficiency, patient safety, or clinical outcomes of a designated organization (AAFP, 2020a). The result of this QI study is, therefore, only generalizable to the TTHSC clinic and not to society or the community as a whole. This study
aimed to recruit at least 15 to 20 participants to enhance the validity of the study. Only three of the 13 providers invited participated in this study, leaving a response rate of only 20%. The number of PCPs dropped from 15 to 13 as one provider left for vacation at the time of the study, and another left the clinic to work in another location. Thus, the small sample size affects the study’s internal validity and external validity (Faber & Fonseca, 2014; Polit & Beck, 2017). This study’s QI design also limited the ability to incorporate control groups, which overall increased the risk of bias. Lastly, the way that question 15 was written had a double negative meaning which made it challenging to interpret the result of the question that was worded in this manner. Future surveys may consider adjusting the wording of this type of question.

The TTHSC clinic was given a two-month notice regarding the study’s purpose and a two-week notice before implementing the project to minimize limitations. Though more time could have been given to participants, this was the best the PI could do due to the unexpected impact of COVID-19 on this project. Additionally, the study was converted from an in-person educational session to an asynchronous online education to comply with the CDC (2020) recommendation to limit face-to-face contact to reduce the spread of COVID-19. Before implementation, the barrier foreseen was the minimal number of PCPs who may have chosen to participate in this QI project due to the high demand for labor and lack of time associated with the COVID-19 pandemic. The PI mitigated this factor by extending the one-day education session to a seven-day educational session to allow the PCPs enough time to complete the project. Lastly, an email reminder was added for the PCPs to receive three days before the study’s termination to increase the number of responses.
The Impact of COVID-19 on This Quality Improvement Project

During the QI initiative processes, several modifications were made to allow this study to move forward. In the pre-implementation phase, the entire world was affected by the COVID-19 pandemic, which caused the PI to lose the original site of the QI project in March of 2020. The original site of implementation was located in Tucson, Arizona, at Arizona Elks Pediatric Clinic. Additionally, the pandemic caused the PI great difficulty getting into contact with any healthcare organization locally or nationally as healthcare workers responded to the pandemic's immediate needs. In May of 2020, the PI was able to contact the medical director of TTHSC in El Paso, Texas, to initiate the QI project at their PC site. The QI project was appropriate and necessary for the clinic at the time of the call, as many adolescents suffered from mental health issues in El Paso. The QI project was implemented successfully from August 3 to 10, but due to the short time from the announcement to the project's initiation, only three providers were able to complete the QI project.

DNP Essentials Addressed

The American Association of College of Nursing (AACN) in 2006 published the Essentials of Doctoral Education for Advanced Nursing Practice that defines the curricular elements that all DNP students must meet to graduate (AACN, 2006).

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

One of the essential elements addressed in this QI project consists of Essential III, which emphasizes the clinical scholarship and analytic methods for EB data (AACN, 2006). The hallmarks of doctoral study often start with the application of scholarship and research into
nursing practice. The PI applied an analytical method to critically appraise high-quality EB data to apply to this study’s educational intervention. The PI further designed, implemented, and evaluated a QI project to determine the project’s impact on the PCP population. The QI project promoted the importance of safe, timely, effective, and efficient identification and treatment of depression to improve adolescents’ mental health. Lastly, the project’s outcome was disseminated to the DNP committee and the TTHSC clinic to enhance healthcare outcomes (AACN, 2006).

**DNP Essential VII: Clinical Prevention and Population Health for Improving the Nation’s Health**

The second element addressed in this study is Essential VII, which highlights the importance of clinical prevention to enhance the nation’s health. Clinical prevention refers to risk reduction or promotion of health strategies to improve individuals or populations’ health (AACN, 2006). The purpose of this was to promote the use of PHQ-9 screening by PCPs to better identify, diagnose, and treat adolescents that come to the clinic with symptoms or risk factors associated with depression. The ideology behind this intervention was the promotion of health in the adolescent population. Additionally, this project addresses the Healthy People 2030 national goal to reduce adolescents’ overall suicide attempts (Healthy People 2030, 2020). Though this objective has been placed in Healthy People 2020, it has continued onwards to Healthy People 2030 as no change in the way these attempts were measured had been identified. The group deemed to be most affected by suicide was individuals in ninth through 12th grade (Healthy People 2030, 2020). Thus, the measurement set by Healthy People 2030 is to reduce the
number of completed suicide attempts from 2.4 to 1.8 per 100,000 individuals in individuals in ninth through 12th grade (Healthy People 2030, 2020).

**DNP Essential VIII: Advanced Nursing Practice**

The final essential addressed in this QI project is Essential VIII, which underlines the importance of demonstrating advanced-level systematic thinking, advanced-level clinical judgment, and EB care dissemination in highly multifaceted practice (AACN, 2006). The PI was able to conduct a comprehensive assessment of depression’s effects on children and adolescents’ mental health at the local, national, and global levels. Based on the area of specialization, the PI recognized the lack of attention to adolescent mental health. In response to this concern, the PI applied EB data and nursing science to design, implement, and evaluate an educational intervention to address the discussed concern at a local PC setting in El Paso, Texas (AACN, 2006).

**Conclusions**

A major depressive disorder is a public health problem among children and adolescents that requires a collaborative interprofessional approach to prevention, early identification, and prompt management. Positive mental health is the desired goal of health promotion and prevention management intervention. Even though depression is treatable, its lack of recognition in PC settings continues to debilitate adolescent’s mental health interfering with social activity, cognitive functioning, and emotional well-being. A systematic literature review demonstrates that little is known about the impact of a nurse-led intervention on PCPs’ knowledge and intent to utilize depression screening as a measure to promote health and prevent illness. These educational intervention results illustrate that nursing-led intervention that targets changing
PCPs’ attitudes and beliefs regarding the significance of depression screening can change individual PCPs’ knowledge and intent. Given the growing incidence of depression in adolescents and the shortage of adequate mental health specialists, this educational intervention is imperative to address as PCPs must become comfortable with screening, diagnosing, and treating depression in their practice area.

**Plan for Sustainability**

The QI intervention must meet the particular needs of the PCPs and the community to promote sustainability. In El Paso, only 5,000 individuals have access to mental health services, and 2% are turned away from receiving such services (University of Texas at El Paso, 2008). Thus, the education of PCPs regarding depression screening, diagnosis, and treatment is imperative to the community’s health. The sustainability plan, therefore, is to continue encouraging the use of PHQ-9 screening in the TTHSC family practice setting for adolescents 12 and older as encouraged by the AAP to improve recognition of adolescent depression. Additionally, a more extensive QI study with a bigger sample size in the future is recommended for the TTHSC team to promote and sustain the routine use of PHQ-9 screening in adolescents 12 years and older in the larger portion of the El Paso community.

**Plan for Dissemination**

The QI findings were disseminated with the study participants via email with the executive summary attached (Appendix A). All identifiable information was withheld from participants. The identifiable information withheld in this study was the demographic information shared by participants. The participants were informed that the project successfully increased the providers’ knowledge by 13.4% and the Likert-based questions by six points. It
was shared that the increase in knowledge did not reach the goal of 20% due to a lack of provider participation. The distribution of an electronic EB educational intervention allowed for smooth and fast dissemination of information. The asynchronous format also allowed the PCPs to complete the intervention at times that were most appropriate for them. The dissemination aimed to increase the PCPs’ knowledge regarding the binding effect that the intervention had on their knowledge and intent to change. Additionally, the study’s findings were disseminated with committee members and interested audiences during the final defense. This form of dissemination helped bring the importance of adolescent depression screening in PC settings into perspective with current and future practitioners. As the results become further disseminated, the issue can gain more perspective by local, national, and global leaders over time.
APPENDIX A:

SITE APPROVAL; EXECUTIVE SUMMARY; THE UNIVERSITY OF ARIZONA

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER
Texas Tech University of Health Science Center
9849 Kenworthy Drive,
El Paso Texas
(915)241-8387

6/29/2020

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

Please note that Ms. Sadaf Carrillo, UA Doctor of Nursing Practice student, has permission of Texas Tech Health Sciences Center outpatient clinic to conduct a quality improvement project at our facility for her project, “Increasing Providers Compliance with PHQ-9 Screening for Adolescents in Primary Care Setting.”

- 9849 Kenworthy Drive, El Paso, Texas 79924

Ms. Carrillo will conduct a pretest-posttest survey of health care providers at the Texas Tech Health Sciences Center outpatient clinic. She will recruit providers through email. The email will provide a description of the project, what they will be asked to do, the time involved, and a link to the online survey. Ms. Carrillo’s activities will be completed by (8/20/2020).

Ms. Carrillo has agreed to provide to my office a copy of the University of Arizona Determination before she recruits participants. She will also will present aggregate results to the providers at their monthly staff meeting.

If there are any questions, please contact my office.

Signed, [signature]
Cheyenne Rincones, DNP, FNP-C
Outpatient Medical Director
Texas Tech Health Sciences Center, El Paso
9849 Kenworthy Drive
El Paso, Texas 79924
(915)241-8387
Depression is a significant public health issue that is negatively impacting our adolescent’s lives by interfering with their cognitive functioning, social activity, emotional well-being, and overall developmental milestone. The five-year recurrence rate of depression in adolescents ranges anywhere from 50% to 70%. 80% of depressed adolescents seek care in a primary care setting, and only 12% seek care in a mental health setting. The American Academy of Pediatrics 2018 guidelines encourage primary care providers to conduct routine depression screening for adolescents in their place of practice.

This project inquiry used an educational intervention to increase the primary care provider’s compliance with routine primary health questionnaire-9 screening for adolescents 12 and older. The total number of participants involved were three primary care providers from the family medicine department of Texas Tech Health Sciences Center. The principal investigator used Ajen’s theory of Planned behavior to help guide this intervention forward.

The quality improvement project was initiated as an online educational intervention beginning on August 3rd to 10th of 2020. A pretest-posttest questionnaire was utilized to measure primary care providers to increase knowledge and intent to change before and after the intervention. The overall results showed a 13.4% increase in provider’s knowledge and a seven-point increase intent to change post-intervention.

The increase in knowledge did not reach 20% due to a lack of provider participation. However, the overall results established that changing providers’ attitudes and beliefs regarding depression screening implications are a strong predictor of change in behavior and intent. This is important to consider because adolescent depression and suicide are currently rising public health issues.

The sustainability plan for this project is to continue encouraging PHQ-9 screening for adolescents 12 and older as encouraged by the American Academy of Pediatric to improve recognition of adolescent depression. Additionally, a
more extensive QI study with a bigger sample size in the upcoming future is encouraged to be completed by the Texas Tech University of Health Science Center team to promote and sustain the routine use of PHQ-9 screening in the El Paso community.

Lastly, I want to thank each one of you for your time and patience with this project. If you have any questions or concerns, please do not hesitate to contact me at doniasadaf@gmail.com or at (915) 929-4962.

Sincerely,

Sadaf Carrillo

Sadaf Carrillo RN-BSN, PMHNP-DNP Candidate
Human Subjects Protection Program

Date: July 14, 2020
Principal Investigator: Sadaf Carrillo
Protocol Number: 2007816821
Protocol Title: Increasing Providers Compliance with PHQ-9 Screening for Adolescents in Primary Care Setting

Determination: Human Subjects Review not Required

Documents Reviewed Concurrently:
- HSPP Forms/Correspondence: determination 2_Edit-1.pdf
- Other Approvals and Authorizations: Texas Tech.pdf

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

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

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

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

CONSENT DOCUMENT (DISCLOSURE FORM AND CONSENT FORM)
Adolescent Depression Screening in Primary Care Setting
Sadaf Carrillo

My name is Sadaf Carrillo, BSN, RN, and I am currently a graduate student at The University of Arizona, in the Doctor of Nursing Practice program, with emphasis on Psychiatric Mental Health Nursing Practice. I am conducting a quality improvement project at Texas Tech Health Sciences Center outpatient clinic using a pretest-posttest design to assess the knowledge and current practices participants have regarding PHQ-9 screening. I am inviting primary care providers at Texas Tech Health Sciences Center outpatient clinic to participate as they play an important role in implementing and disseminating depression screening to adolescents ages 12 to 18 years of age.

The primary purpose of this quality improvement initiative is to expand the provider’s knowledge and intent in using the PHQ-9 screening to help identify, diagnose, and treat adolescents who are suffering from or at risk for depression at Texas Tech Health Sciences Center outpatient clinic. By increasing knowledge and usage of PHQ-9 screening at Texas Tech Health Sciences Center outpatient clinic, youth with depression can be treated earlier, which may help decrease the rate of adverse outcomes associated with depression.

Participation in this project is voluntary. The members have the right to refuse to participate, give information, and withdraw from the educational session at any given time. Please remember that the questionnaire response will remain anonymous.

If you choose to take part in this project, you will be asked to complete three significant steps:

- **Step one:** Please complete an anonymous pretest online survey about adolescent depression screening in primary care. This is to be completed before starting the recorded PowerPoint presentation.
- **Step two:** Watch the 15-minute recorded PowerPoint presentation at your pace. The content will cover the following objectives: Background information about adolescent depression, risk factors associated with depression, the effect of adolescent depression in the U.S. versus Texas versus El Paso, screening guidelines endorsed by the American Academy of Pediatrics, credible tools available for depression screening, the benefits of PHQ-9 screening in primary care, and the final recommendations to follow for routine screening.
- **Step three:** Please complete an anonymous post-test online survey about adolescent depression screening in primary care. This is to be completed after starting the recorded PowerPoint presentation.

It will take approximately five minutes to complete each survey (pre- and post-). There are no foreseeable risks associated with participating in this project, and you will receive no immediate benefit from your participation. Survey responses are anonymous.
If you choose to participate in the project, participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw at any time from the project. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project.

For questions, concerns, or complaints about the project, you may call Sadaf Carrillo, DNP student, at (915) 929-4962 or contact me by email at sfalamarzi@email.arizona.edu.

Thank you for your time and consideration.

Best Regards,

Sadaf Carrillo, DNP-PMHP candidate

By agreeing to participate you are indicating that: you are at least 18 years of age and you have read and comprehend the informed consent.

Yes, I agree
APPENDIX C:

RECRUITMENT MATERIAL (RECRUITMENT FLYER AND REMINDER EMAIL)
A fifteen minute recorded PowerPoint is given to primary care providers addressing adolescent depression screening in primary care setting. Providers will be asked to complete a pretest posttest survey to evaluate knowledge gained from the presentation. Education will be sent via email where participants have seven days to access Panopto PowerPoint and complete pretest posttest questionnaires. All of participants information will be confidential.

If you are interested to participate please contact Sadaf Carrillo at sfalamarzi@email.arizona.edu or text/call at (915)929-4962.
Educational Intervention Reminder Email

Hello Everyone,

This is an email reminding all primary care providers that educational intervention asynchronous learning will close in three days (August 10th). If you would like to participate in this quality improvement project about adolescent depression screening, please follow the first link for the pretest questionnaire, the second link for the 15-minute recorded PowerPoint presentation, and the third link for the posttest questionnaire:

**Link 1:**
[https://uarizona.co1.qualtrics.com/jfe/form/SV_8eL0k9kYynatcKV](https://uarizona.co1.qualtrics.com/jfe/form/SV_8eL0k9kYynatcKV)

**Link 2:**
[https://arizona.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=2dceb32c-b576-43d7-b87d-abd10039bef2](https://arizona.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=2dceb32c-b576-43d7-b87d-abd10039bef2)

**Link 3:**
[https://uarizona.co1.qualtrics.com/jfe/form/SV_8nXx6OXDbDoBlfT](https://uarizona.co1.qualtrics.com/jfe/form/SV_8nXx6OXDbDoBlfT)

You are not required to give any of your personal information to the principal investigator. The information will solely be used for the completion of the DNP project. By answering the questions, you agree to allow the principal investigator to utilize the information for the completion of the DNP project.

For any questions or concerns, please don’t hesitate to contact Sadaf Carrillo at sfalamarzi@email.arizona.edu or call/text at (915) 929-4962.

Thank you for your time and consideration.

Best Regards,

Sadaf Carrillo, DNP-PMHNP candidate
APPENDIX D:

EVALUATION INSTRUMENTS (PRE-TEST AND POST-TEST QUESTIONNAIRES)
Pretest Questionnaires

Demographic Information:

1. Age
   (1) 18-35  (2) 36-50  (3) >51

2. Gender
   (1) Female  (2) Male  (3) Other

3. Specialty
   (1) Medical Doctor  (2) Doctor of Osteopathy  (3) Nurse Practitioner
   (4) Physician Assistant

4. Highest Degree of Education
   (1) Medical Degree  (2) Masters  (3) Doctorate

5. Years in Practice
   (1) 0-5  (2) 6-10  (3) >10

Please select one of the answers for the following questions.

6. Suicide is currently the _______ leading cause of death in adolescent 15 to 19 years of age?
   a) Tenth
   b) Eighth
   c) Second
   d) Third
   e) None of the above

7. Which of the following risk factors is associated with depression in adolescents?
   a) Medications
   b) Family history of depression
   c) Low socioeconomic status
   d) History of trauma
   e) All of the above

8. What is the five-year recurrence rate of depression in adolescents?
   a) 20% to 30%
   b) 30% to 50%
   c) 50% to 70%
   d) 70% to 90%
   e) None of the above
9. The American Academy of Pediatric 2018 guidelines recommends adolescents 12 years and older to be screened how often?
   a) Annually unless risk factors require a more frequent check
   b) Twice a year
   c) Only when patient presents with depressive symptoms
   d) Once every three years
   e) Never

10. The PHQ-9 is considered an ideal screening tool for adolescents for which of the following reasons?
    a) It has sensitivity of about 88% and specificity of 90%
    b) It screens symptoms based on the required diagnostic criteria
    c) It is sensitive to change
    d) It can be incorporated in measurement-based care
    e) All of the above

11. I am compliant with distributing or implementing the PHQ-9 screen with adolescents 12 and older
   (1) Strongly agree      (2) Somewhat agree    (3) Neither agree nor disagree
   (4) Somewhat disagree   (5) Strongly Disagree

12. I am aware of the screening, assessment/diagnosis, and management recommendations that are presented by the American Academy of Pediatrics
   (1) Strongly agree      (2) Somewhat agree    (3) Neither agree nor disagree
   (4) Somewhat disagree   (5) Strongly Disagree

13. I agree with the 2018 screening guidelines that has been published by the American Academy of Pediatrics
   (1) Strongly agree      (2) Somewhat agree    (3) Neither agree nor disagree
   (4) Somewhat disagree   (5) Strongly Disagree

14. I am aware of the common risk factors that are associated with depression in adolescents 12 to 18 years of age.
   (1) Strongly agree      (2) Somewhat agree    (3) Neither agree nor disagree
   (4) Somewhat disagree   (5) Strongly Disagree

15. I have no intent to administer the PHQ-9 screening in my current practice.
   (1) Strongly agree      (2) Somewhat agree    (3) Neither agree nor disagree
   (4) Somewhat disagree   (5) Strongly Disagree
Posttest Questionnaires

Demographic Information:

1. Age
   (1) 18-35    (2) 36-50    (3) >51

2. Gender
   (1) Female    (2) Male    (3) Other

3. Specialty
   (1) Medical Doctor    (2) Doctor of Osteopathy    (3) Nurse Practitioner
      (4) Physician Assistant

4. Highest Degree of Education
   (1) Medical Degree    (2) Masters    (3) Doctorate

5. Years in Practice
   (1) 0-5    (2) 6-10    (3) >10

Please select one of the answers for the following questions.

6. Suicide is currently the ______leading cause of death in adolescent 15 to 19 years of age?
   a. Tenth
   b. Eighth
   c. Second
   d. Third
   e. None of the above

7. Which of the following risk factors is associated with depression in adolescents?
   a. Medications
   b. Family history of depression
   c. Low socioeconomic status
   d. History of trauma
   e. All of the above

8. What is the five-year recurrence rate of depression in adolescents:
   a. 20% to 30%
   b. 30% to 50%
   c. 50% to 70%
   d. 70% to 90%
   e. None of the above
9. The American Academy of Pediatric 2018 guidelines recommends adolescents 12 years and older to be screened how often?
   a. Annually unless risk factors require a more frequent check
   b. Twice a year
   c. Only when patient presents with depressive symptoms
   d. Once every three years
   e. Never

10. The PHQ-9 is considered an ideal screening tool for adolescents for which of the following reasons?
    a. It has sensitivity of about 88% and specificity of 90%
    b. It screens symptoms based on the required diagnostic criteria
    c. It is sensitive to change
    d. It can be incorporated in measurement-based care
    e. All of the above

*Please rank the following questions from strongly agree, somewhat agree, neither agree nor disagree, somewhat disagree, strongly disagree.*

11. I will now become compliant with distributing or implementing the PHQ-9 screen with adolescents 12 and older
    (1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree
    (4) Somewhat disagree (5) Strongly Disagree

12. I am now aware of the screening, assessment/diagnosis, and management recommendations that are presented by the American Academy of Pediatrics
    (1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree
    (4) Somewhat disagree (5) Strongly Disagree

13. I now agree with the 2018 screening guidelines that has been published by the American Academy of Pediatrics
    (1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree
    (4) Somewhat disagree (5) Strongly Disagree

14. I am now aware of the common risk factors that are associated with depression in adolescents 12 to 18 years of age.
    (1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree
    (4) Somewhat disagree (5) Strongly Disagree

15. I continue to have no desire to administer the PHQ-9 screening in my current practice.
    (1) Strongly agree (2) Somewhat agree (3) Neither agree nor disagree
    (4) Somewhat disagree (5) Strongly Disagree
APPENDIX E:

PARTICIPANT MATERIAL (INSTRUCTION FOR THE EDUCATIONAL INTERVENTION DURING THE OPENING OF CONTENT; ASYNCHRONOUS ZOOM PRESENTATION; PRESENTATION POWERPOINT)
Instruction for the Educational Intervention During the Opening of Content

Adolescent Depression Screening in Primary Care Setting

Sadaf Carrillo

This email is to inform you that the educational recorded PowerPoint presentation is now open (August 3rd) for the primary care provider to complete. The informative content will remain open for a total of seven days. On (August 10th), the educational intervention and the pretest-posttest questionnaire will no longer be available to complete.

As a reminder, my name is Sadaf Carrillo, BSN, RN, and I am currently a graduate student at The University of Arizona, in the Doctor of Nursing Practice program, with emphasis on Psychiatric Mental Health Nursing Practice. I am conducting a quality improvement project at Texas Tech Health Sciences Center outpatient clinic using a pretest-posttest design to assess the knowledge and current practices participants have regarding PHQ-9 screening. I am inviting primary care providers at Texas Tech Health Sciences Center outpatient clinic to participate as they play an important role in implementing and disseminating depression screening to adolescents ages 12 to 18 years of age.

The primary purpose of this quality improvement initiative is to expand the provider’s knowledge and intent in using the PHQ-9 screening to help identify, diagnose, and treat adolescents who are suffering from or at risk for depression at Texas Tech Health Sciences Center outpatient clinic. By increasing knowledge and usage of PHQ-9 screening at Texas Tech Health Sciences Center outpatient clinic, youth with depression can be treated earlier, which may help decrease the rate of adverse outcomes associated with depression.

Participation in this project is voluntary. The members have the right to refuse to participate, give information, and withdraw from the educational session at any given time. Please remember that the questionnaire response will remain anonymous.

If you choose to take part in this project, you will be asked to complete three major steps:

- **Step one**: Please complete an anonymous *pretest online survey* about adolescent depression screening in primary care. This is to be completed *before* starting the recorded PowerPoint presentation. To complete this portion, please click the following link. [https://uarizona.co1.qualtrics.com/jfe/form/SV_8eL0k9kYynatcKV](https://uarizona.co1.qualtrics.com/jfe/form/SV_8eL0k9kYynatcKV)

- **Step two**: Watch the 15-minute *recorded PowerPoint presentation* at your pace. The content will cover the following objectives: Background information about adolescent depression, risk factors associated with depression, the effect of adolescent depression in the U.S. versus Texas versus El Paso, screening guidelines endorsed by the American Academy of Pediatrics, credible tools available for depression screening, the benefits of PHQ-9 screening in primary care, and the final recommendations to follow for routine screening. To complete this portion, please click the following link.
Step three: Please complete an anonymous **post-test online survey** about adolescent depression screening in primary care. This is to be completed after starting the recorded PowerPoint presentation. To complete this portion, please click the following link.
https://uarizona.co1.qualtrics.com/jfe/form/SV_8nXx6OXDbDoBlfT

It will take approximately five minutes to complete each survey (pre- and post-). There are no foreseeable risks associated with participating in this project, and you will receive no immediate benefit from your participation. Survey responses are anonymous.

If you choose to participate in the project, participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw at any time from the project. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project.

For questions, concerns, or complaints about the project, you may call Sadaf Carrillo, DNP student, at (915)9294962 or contact me by email at sfalamarzi@email.arizona.edu.

Thank you for your time and consideration.

Best Regards,

Sadaf Carrillo, DNP-PMHNP candidate
Participant Material

Asynchronous Zoom Presentation

*Link to the presentation:*

https://arizona.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=2dceb32c-b576-43d7-b87d-abd10039bef2
Adolescent Depression Screening Using PHQ-9

By: Sadaf Carrillo, BSN, RN
PMHNP-DNP Candidate

Objectives

• Background about depression in youths
• Risk factors associated with depression
• The effect of depression in U.S., Texas, and El Paso County
• Screening guidelines endorsed by the American Academy of Pediatrics
• Screening tools available for depression screening
• The benefits of PHQ-9 screening in primary care
• Final Recommendation to follow
Background

• 10% to 20% of adolescents have MDD worldwide
• Five-year recurrence rate of 50% to 70%
• Rapidly increasing
• Progresses to adulthood
• 13.3% experience at least one MDD episode

Risk Factors Associated with Depression

• Personal or family history of depression
• Major life changes, trauma, or stress
• Medications
• Chronic illnesses
• Pregnancy
• Homelessness
• Lack of social support system
• Low socioeconomic status
Adverse Outcome

- Impacts functionality
- Substance abuse
- Unemployment
- Increased criminal behaviors
- Worst outcome being suicide
- 56% rise in suicide from 2007 -2017
- Now 2nd leading cause of death in adolescents 15 – 19
- Economical burden

Is Depression in Youths a Problem in Texas?

- Annual average percentage of MDD has rapidly increased between 2004-2008 & 2013-2020
- 34% of HS students in Texas report depression compared to 31% nationally
- 5% of HS students in Texas report attempting suicide within the past twelve months as opposed to 2% of students nationally
- Only ~25% of youths are estimated to receive treatment for depression
Is Suicide in Youths a Local Problem in Texas?

Trend of depression in El Paso County

- **13,000** adolescents are currently suffering or at risk for depression
- **30 organizations** available to treat adolescents for mental health
- Yet only **5,000** have access to mental health services
- **2%** or **429** individuals are turned away
- Why is there lack of mental health service?
  - lack of funding
  - service availability
  - service capacity
Why should We Care?

• 80% of adolescents with depression seek care with PCPs
• only 12% see mental health specialists
• In PC two of three fail to become diagnosed with depression
• Of those who are recognized one in five use services
• 40-50% of families terminate services (e.g., stigma, financial barrier, specialist shortage)
• End result is only 25.3% receiving specialty care

Screening Recommendations in Primary Care

• American Academy of Pediatrics 2018 guidelines Presents:
  • Screening
    • Screen adolescents 12 years and older annually
    • Screen those with risk factors more frequently; optimal frequency rate not given
  • Assessment/diagnosis
    • If positive assess for depressive symptoms using the DSM-5 criteria
    • Interview family members and child
Screening Recommendations in Primary Care Cont.

• **Management**
  - Counsel
  - Discuss treatment options
  - Develop treatment plan
  - Establish safety plan

Screening Tools

• No universal screening
• Various screening tools are available but are all reliable?
• Ideal screening tool is reliable, brief, easy to score, and self-administered
• The Beck Depression Inventory (BDI-II) and the patient health questionnaire (PHQ-9)
PHQ-9 Screening Tools

- PHQ-9 sensitivity ~88%, specificity ~90%
- Based on the diagnostic criteria for depression
- Sensitive to change
- Monitor change in treatment
- Essential for measurement-based care
- Above 10 indicates for further evaluation

<table>
<thead>
<tr>
<th>PHQ-9</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>~88%</td>
<td>~90%</td>
<td></td>
</tr>
</tbody>
</table>

Final Recommendations

- Depression is highly prevalent in adolescents
- Many do not receive preventive services
- Annual screening are recommended
- PHQ-9 meets the ideal based criteria for use
- >10 indicates for further investigation
References


Reference Cont.


References Cont.

The conversation. (2019). Depression: It's a word we use a lot, but what exactly is it? https://theconversation.com/depression-its-a-word-we-use-a-lot-but-what-exactly-is-it-122381


APPENDIX F:

PROJECT TIMELINE
<table>
<thead>
<tr>
<th>Completion Date</th>
<th>Planning</th>
<th>Pre-Implementation</th>
<th>Implementation</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/28/2018</td>
<td>Met with key stakeholders in Arizona Elks Pediatric Clinic to obtain support</td>
<td></td>
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<tr>
<td>1/25/2019</td>
<td>Contacted medical director and updated her regarding the QI process</td>
<td></td>
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<tr>
<td>3/31/2020</td>
<td>Lost original site at Arizona Elk Pediatric Clinic for implementation due to COVID-19 Pandemic</td>
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<tr>
<td>5/20/2020</td>
<td>Spoke with medical director of Texas Tech regarding site needed for project implementation</td>
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<tr>
<td>6/02/2020</td>
<td>Medical director of Texas Tech agreed to sign placement form</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6/24/2020</td>
<td>Oral proposal defense completed</td>
<td></td>
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<tr>
<td>6/26/2020</td>
<td>Submitted IRB contents to Dr. Pasvogel</td>
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<tr>
<td>7/4/2020</td>
<td>QI project approved by the University of Arizona College of Nursing Departmental Review Committee</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>7/14/2020</td>
<td>QI project approved by IRB</td>
<td></td>
<td></td>
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<tr>
<td>7/20/2020</td>
<td>Emails and flyers sent out to recruit participants</td>
<td></td>
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<tr>
<td>8/3/2020</td>
<td>QI project implementation initiated at the TTUHSC Clinic</td>
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<tr>
<td>8/10/2020</td>
<td>QI project implementation concluded at the TTUHSC Clinic</td>
<td></td>
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<tr>
<td>8/17/2020</td>
<td>Data analysis initiated</td>
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<tr>
<td>9/9/2020</td>
<td>Data analysis completed</td>
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<tr>
<td>11/04/2020</td>
<td>Final defense</td>
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</tbody>
</table>
APPENDIX G:

LITERATURE REVIEW GRID
<table>
<thead>
<tr>
<th>Name of Research Article, Author, Year</th>
<th>Study Design</th>
<th>Research Question/Hypothesis</th>
<th>Sample Size</th>
<th>Analysis Method</th>
<th>Findings</th>
<th>Support and/or Link to Project</th>
</tr>
</thead>
</table>
| **Name:** Physician intervention to positive depression screens among adolescents in primary care  
**Authors:** Aalsama et al., 2018 | Cohort study | How does incorporation of computerized depression screening and response driven clinician management into a primary care computer decision system impacts clinician identification and treatment of adolescents who present with depression symptoms? | N=2038 For adolescents ages 12 to 20, mean age 15.6. 51% female and 49% male | 1) The first visit descriptive statistics were calculated for PHQ-9 scores, demographic, site, and follow up visit.  
2) Then prevalence of depression screening and clinician treatment for depression was calculated. Fisher’s test was conducted to evaluate prevalence of depression among different depression groups (mild, moderate, severe).  
3) Logistic regression showed mental health referral and SSRI initiation using these predictors: PHQ-9 score, clinic type (pediatrician, | 1) The highest predictors that predicted physician reported referral was clinical site (P<0.001), PHQ-9 score (P<0.01), however the different clinical type and adolescent’s demographic was not a predictor of clinician initiation of an SSRI | 1) This study shows that PHQ-9 screening can be successfully implemented as an algorithm using CDSS to enhance clinician compliance with screening.  
2) Scoring of severe in PHQ-9 did impact clinicians to start SSRI  
3) High internal validity.  
4) Risk of bias  
5) Can be translated into practice only in organization with existing CDSS |
<table>
<thead>
<tr>
<th>Name of Research Article, Author, Year</th>
<th>Study Design</th>
<th>Research Question/Hypothesis</th>
<th>Sample Size</th>
<th>Analysis Method</th>
<th>Findings</th>
<th>Support and/or Link to Project</th>
</tr>
</thead>
</table>
| **Name:** Accuracy of Depression Screening Tools to Detect Major Depression in Children and Adolescents: A Systematic Review  
**Author:** Roseman et al., 2016 | Systemic Review | How accurate are PHQ-9 depression screening instruments in detecting depression in children and adolescents compared to other tools? | Of 4608 articles  
20 articles reviewed and 17 studied; children ages 6 to 18 | 1) screening tools were extracted with 95% confidence intervals  
2) Quality Assessment for Diagnostic Accuracy Studies–2 (QUADAS-2) tool was utilize to assess the risk of bias | 1) 3 studies reported PHQ-9 having optimal score that ranged from 5 to 15 with confidence interval of 28% for sensitivity & 8% specificity  
2) Other tools 95% confident interval showed a median sensitivity of 33% and specificity of 11%  
3) Risk of bias was high from 16 out of 17 studies. | 1) There are few studies that have reviewed the accuracy of depression screening tools but only BDI and PHQ-9 shown to have diagnostic accuracy.  
2) The review found that depression screening alone does not have sufficient evidence to detect MDD in children and adolescent. |
| **Name:** Screening for and diagnosis of depression among adolescents in a large health maintenance organization  
**Author:** Lewandowski et al., 2016 | Retrospective cohort study | Has there been any changes in pattern of depression screening and diagnosis for adolescents in the last three years in an HMO in pediatric primary, adult primary, and mental health unit? | N=44,342 adolescents ages 12 to 21 who have visited a primary or mental health provider in HMO facility from year 2010, 2011, and 2012.  
1) There were two series patient data summaries. First series researchers identify those who were administered the PHQ-9, identify those who scored above the cutoff point (number unknown) and | 1) The number of PHQ-9 screening in all departments changed significantly (P<0.001).  
2) There was an increase in positive PHQ-9 results in pediatric primary (P<0.001).  
3) The proportion of adolescents who were referred to mental | 1) Lacks external validity as it only examines depression screening with an HMO organization. Difficult to translate into practice  
2) Low internal validity. The cutoff point of PHQ-9 is non-identified. |
<table>
<thead>
<tr>
<th>Study Design</th>
<th>Research Question/Hypothesis</th>
<th>Sample Size</th>
<th>Analysis Method</th>
<th>Findings</th>
<th>Support and/or Link to Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retrospective chart review</td>
<td>Does using standardized depression screening protocol (PHQ-9) help identify adolescents who are at risk for depression?</td>
<td>N=256 adolescents 12 to 18 years of age. 137 females and 119 males.</td>
<td>1) Data was analyzed using SPSS 24.0 software to measure 2) Descriptive statistical method</td>
<td>1) 144 out of 256 adolescents were screening using PHQ-9 2) (n=238, 93%) of adolescents screened were Hispanic. Insurance status included public (n = 177, 69.1%) and private (n = 12, 4.7%); (n = 67, 26.2%) were uninsured. Most of the visits were for episodic illness (n = 180, 70.3%) versus wellness (n = 76, 29.7%) visits. 46.1% (n = 118) of kids</td>
<td>1) Though PHQ-9 alone by itself is not enough to detect depression, it does improve early treatment and diagnosis of depression.</td>
</tr>
<tr>
<td>Name of Research Article, Author, Year</td>
<td>Study Design</td>
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<td>Analysis Method</td>
<td>Findings</td>
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<td>were 12–14 years old and 53.9% (n = 138) 15–18 years old. (3.9%, n = 10) of the children had documentation of depression which (n = 8; 80%) were female and (n = 2; 20%) were male. 3) Statistically significant relationships existed gender, tiredness, and sleep issues. Female showed a more likeliness to report sleep problems (p = 0.002) and tiredness (p = 0.013) than males. Significant associations between low self-esteem, sleep issues and age were also found. The 15–18 age group was more likely to experience sleep problems (47.6% n = 40 vs. 28.3% n = 17) (p = 0.02) and low self-esteem (22.6%, n = 19 vs. 8.3%, n = 5) (p = 0.023) than the</td>
</tr>
<tr>
<td>Name of Research Article, Author, Year</td>
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<td>PHQ-9 Administration in Outpatient Adolescent Psychiatry Services</td>
<td>Retrospective cohort study</td>
<td>What is PHQ-9 feasibility in outpatient adolescents?</td>
<td>N=325 adolescents ages 12-18 were given the PHQ-9 screening upon their visit to the Boston Children’s Hospital clinic. 62% of patients were male (N=202);</td>
<td>1) PHQ-9 was administered by the CDSS 2) Descriptive statistics were calculated for PHQ-9 scores</td>
<td>1) The PPV for depression using PHQ-9 was 77% (3). 2) The PHQ-9 scores were significantly correlated with the Children’s Global Assessment Scale (P&lt;0.001) meaning that higher depressive symptoms were associated with lower functioning 3) High PHQ-9 scores were significantly</td>
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<td>Name: Depression and its psychosocial risk factors in pregnant Kenyan adolescents: A cross-sectional study in a community health Centre of Nairobi Authors: Osok et al., 2018</td>
<td>Cross-sectional study</td>
<td>What is the prevalence of depression and psychosocial risks among pregnant adolescents in Nairobi, Kenya who attend the community health clinic? N=176, pregnant female adolescents ages 15 to 18 with average age being 16.5</td>
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<td>1) Depressed (&gt;15 on PHQ-9) and non-depressed groups were compared using chi square test. 2) Sample t-test and ANOVA used to correlate each group with PHQ-9 score. 3) Regression analysis was done to determine the predictor of depression from the psychosocial factors strongly associated with univariate analysis</td>
<td>1) Univariate analysis results indicated that positive HIV diagnosis (P&lt;0.001), domestic violence (P&lt;0.001), irregularly attending clinic (P&lt;0.001), substance abuse (P=0.019), experiencing stressful events (P&lt;0.001), having previous children (P&lt;0.001), negative reaction to pregnancy (P&lt;0.001), lack of social support (P&lt;0.001), temporary housing (P&lt;0.001), higher monthly income (P=0.035), living with parents (P&lt;0.001), being a single parent (P&lt;0.001), unemployed (P=0.020), and being associated with re-administering the PHQ-9 screening (P&lt;0.001).</td>
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| **Name:** Probability of major depression diagnostic classification using semi-structured versus fully structured diagnostic interviews  
**Author:** Levis et al., 2018 | Meta-analysis | What is the association between semi vs full structured interview and depression in primary care? | N= out of 5248 unique articles identified, 5039 were excluded leaving 113 to be reviewed, leaving in which 69 met the inclusion criteria and of the 69 unique samples, 55 contributed data (80%). | 1) A binomial generalized linear mixed models (GLMMs) was used to isolate association between MDD classification and diagnostic method.  
2) First, GLMM was associated among studies that used semi- structured interviews and then, GLMM was estimated among studies that used fully structured interviews.  
3) GLMM was then utilized to compare odds MDD classification in semi-structured interviews vs | 1) Fully structured interviews showed a higher probability of MDD for PHQ-9 scores of 0 to 10, but showed lower probability of MDD for PHQ-9 scores of 11–27.  
2) The Odd Ratio (OR) for the interaction between PHQ-9 score and fully structured interview was 0.90 (95% CI = 0.88–0.92), suggesting 10% dilution in the slope of the odds of a MDD classification across PHQ-9 scores for fully structured interviews compared with semi-structured interviews. | 1) This study compares accuracy of PHQ-9 to detect MDD  
2) This comes to show that, the Mini International Neuropsychiatric Interview (MINI) diagnostic interview showed the best correlation of MDD classification than the Composite International Diagnostic Interview (CIDI), controlling for depression symptom scores on the PHQ-9 and other patient characteristics. We also found that compared with semi-structured interviews, fully structured interviews tend to classify more people with low-level symptoms as |
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<td>Integrating Mental Health into Adolescent Annual Visits: Impact of Pre-visit Comprehensive Screening on Within-Visit Processes</td>
<td>Quasi-experimental</td>
<td>Does regular multidimensional CDSS help enhance discussing mental health in PC setting?</td>
<td>N= 72 adolescents ages 12-18 70.3% female and 29.7% male</td>
<td>fully structured interviews 4)Lastly a possible interaction between interview assessment method and depressive symptom using PHQ-9 was assessed via sensitive analysis</td>
<td>1) Visits with and without DartScreen were compared using the RIAS variables of binary outcome of whether a topic was addressed during the visit, a summative comparison of mean statements per visit applied to RIAS categories, somatic, substance abuse, mental health 1) The most frequent positive screens were nutrition (86%), exercise (43%), safety (31%), drugs (23%), alcohol (17%), depression (17%), anxiety (14%), tobacco (14%), and school problems (11%). For mental health, there were 10 teens with a positive PHQ-2, among whom six also had a positive PHQ-9. Five anxiety screens were positive, among which three were also positive for PHQ-9.</td>
<td>1) Adds variety as this was done one in rural pediatric clinic and one in urban 2) Does not assess PHQ-9 solely but PHQ-2 &amp; PHQ9 was incorporated into DART screen (review of overall symptoms) 3) May incorporate PHQ-9 screen as part of DART since identification alone does not reduce numbers of depression</td>
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<td>Name: Guidelines for Adolescent Depression in Primary Care (GLAD-PC): Part I. Practice Preparation, Identification, Assessment, and Initial Management</td>
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<td>Clinical Practice Guideline; systemic review and meta-analysis</td>
<td>What are the most updated guidelines to assist PCP to identify and manage depression?</td>
<td>N=135 article reviewed and 8 remaining being the most relevant chosen</td>
<td>1) Literature review was conducted</td>
<td>1) Initial management of PCP includes annual universal depression screening ages 12 and over 2) Identify those at-risk using screening 3) Use Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition criteria for diagnosis 4) Implement family and adolescent psychoeducation</td>
<td>1) This guideline can assist PCPs to identify and manage adolescents during initial interaction</td>
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<td><strong>Author:</strong> Zuckerbrot et al., 2018</td>
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<td>5) Establish links to community</td>
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<td>6) Establish links to the community</td>
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**Name:** Effectiveness in Regular Practice of Collaborative Care for Depression Among Adolescents: A Retrospective Cohort Study

**Authors:** Shippee et al., 2018

**Study Design:** Retrospective cohort study

**Research Question/Hypothesis:** What is the primary clinical outcome of ongoing collaborative care of depressed adolescents in PC?

**Sample Size:** N= 661; 342 female & 319 males, ages 12–18 and scored higher than 10 on the PHQ-9

**Analysis Method:**
1) First, logistic regression models were used to control all covariates to produce marginal adjusted predictions
2) For propensity score matching, Stata’s effects psmatch command was utilized

**Findings:**
1) Collaborative care for adolescent depression within a busy pediatric and family medicine outpatient practice was associated with higher rates of improved mood at six months, compared with usual care (P<0.001). Remission rates were also higher (P<0.05)

**Support and/or Link to Project:**
1) APNs can begin to work collaboratively with PCPs to implement this model of care to improve depression outcomes
2) As studies how, depression screening alone will not prevent depression
3) Creating access to mental health care at the clinic has shown significant result in previous studies as well
APPENDIX H:

OTHER DOCUMENTS AS APPLICABLE TO THE PROJECT (MODEL FOR IMPROVEMENT AND PDSA CYCLE)
Model for Improvement

**AIM**
- Enhance provider’s knowledge regarding adolescent in addition to increasing providers intention to screen using the PHQ-9 screening in the selected PC settings by 20% seven days after implementation
- The objective knowledge of providers regarding AAP guidelines and PHQ-9 screening
- The intention to change

**MEASUREMENT**
- Disseminate an evidence-based educational presentation to change intent, attitude, and knowledge regarding the screening tool.

**CHANGE**

**Plan**
- The educational sessions will be conducted at: TTUHSC Clinic
- Focus population: Primary care providers who are 18 and older
- Goal: Enhance provider’s knowledge and providers intent
- Overall education: 25 minutes
- The overall cost: $0
- Data used: pretest posttest questionnaire
- Time of presentation: 15 minutes

**Do**
- Intervention: Asynchronous educational session
- Session: 25 minutes. Content will be open for seven days
- Data: pertest-posttest questionnaire via Qualtrics

**Study**
- The objective knowledge of the questionnaires will be analyzed by calculating the percentage of those who correctly responded to the questionnaires.
- Comparisons of knowledge differences for Likert questions will be displayed via bar graph

**Act**
- Adapt, adopt, or discard the changes tested
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