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Improving Depression Screening and Follow-up Care in Underserved Populations

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Abstract

Depression is a substantial source of financial, emotional, and physical burdens to patients and their families worldwide. It also disproportionately affects economically disadvantaged populations. To combat the depression crisis, The United States Preventive Services Task Force (USPSTF) published guidelines to boost depression screenings of all patients presenting for healthcare services. A review of literature and the completed needs assessment confirmed low rates of depression screening in the rural primary care sector. This project took place in an outpatient primary care facility in rural Arkansas, where current depression screening tools were not being used. The goal was to increase the percentage of depression screenings in primary care to 50% from the national average of 5% by March 2022. The purpose of this project was to increase depression recognition thereby improving the patient's outcomes. Data collection before and after the Patient Health Questionnaire 9 (PHQ-9) implementation phase was analyzed to evaluate outcome, process, and balancing measures. PHQ-9 scores and patient outcomes were compared using descriptive statistics and run charts. Pre- and post- implementation of depression diagnoses using an independent samples t-test were analyzed. There were 729 retrospective charts reviewed for depression diagnosis in the pre-implementation phase compared to 529 concurrent chart reviews in the post-implementation period. An independent samples t-test was conducted which demonstrated a statistically significant increase in depression diagnosis, $t(528) = 13.070$, $p < .000$ following implementation of the PHQ-9 screening. Long-term sustainability will depend on continued depression screening and follow-up care for persons screened and those diagnosed with depression.

Keywords: depression, PHQ-9, economically disadvantaged, access to depression care

Improving Depression Screening and Follow-Up Care in Underserved Populations

The purpose of this project was to detail a DNP quality improvement project designed to promote depression awareness and management of the adult population through the utilization of a depression screening tool, the Patient Health Questionnaire (PHQ-9), in a rural outpatient clinic. Mental health conditions have tripled over the past year due to the Coronavirus Disease of 2019 (COVID-19) pandemic along with society's perception of depression (Czeisler et al., 2020). The influx of symptomatic patients forced healthcare professionals to reevaluate their depression management protocols to better manage community needs. This project discussed current barriers assessing depression in rural primary care, details the significance, project design, evaluation methods, and provides a literature review of best practices for depression screening and care management through evidence-based protocols.

Background and Significance

Depression

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), is considered the most comprehensive, current, and critical resource available to healthcare professionals, social workers, and forensic/legal specialists to classify mental health disorders (American Psychiatric Association, 2013). According to DSM-5 depression diagnosis is made if the individual is experiencing at least five symptoms during a 2-week period with one belonging to either depressed mood or loss of interest/pleasure (American Psychiatric Association, 2013). Depression may take on slightly unusual characteristics or develop under unique circumstances leading to distinct categories or forms of depression. The different forms of depression include persistent depressive disorder, postpartum depression, psychotic depression, seasonal affective disorder, bipolar disorder, and the newly added diagnostic classifications of DSM-5 disruptive

mood dysregulation disorder, and premenstrual dysphoric disorder (PMDD) (NIMH, 2018).

Depression is a common chronic illness affecting more than 264 million people worldwide (WHO, 2021). Negatively impacting the patient's ability to perform routine daily activities due to increased thoughts of sadness or a loss of interest in things they once found pleasurable, depression can be linked to alcoholism, tobacco abuse, sedentary lifestyles, dietary deficiencies, social exclusion, and intensifies other comorbid conditions causing decreased quality of life (American Psychiatric Association, 2021; Kepler et al., 2018; Liungqvist et al., 2016; Panaite et al., 2019).

Depression Screening

The U.S. Preventative Services Task Force (USPSTF) clinical guidelines recommended universal depression screening of all patients in 2016 in the primary care setting, as a primary source of depression identification (Jin & Wu, 2020). Despite new guidelines, depression screenings remain stifled affecting the underserved and minority populations that prefer primary care over specialty mental health professionals or the emergency department for mental health services (Jin & Wu, 2020). Impediments to depression screenings in the primary care sector have been equated to the perceived inadequate training, provider investment, time constraints, and lack of a gold standard depression screen (Jin & Wu, 2020; Samples et al., 2020). Currently, The Beck Depression Inventory, Center for Epidemiological Studies Depression (CESD), PHQ-9, Self-Reporting Questionnaire (SRQ-20), Hamilton-D, and Kessler 6 and 10 are all vetted as appropriated depression screening tools to be utilized for depression management with no guidance on which screening is more appropriate for use in the primary care setting (Garland et al., 2018). Thus, universal depression screenings have not been adopted globally let alone regionally despite recommendations in most healthcare facilities.

Chronicity and Unmanaged leading to suicide

Depression is the most treatable mental health condition with 80% to 90% of patients responding favorably or gaining at the very least some relief from chronicity of symptoms (American Psychiatric Association, 2021). Depression treatment is unique to each patient's distinctive condition and circumstance. Underlying medical conditions such as vitamin deficiencies, brain tumors, or thyroid problems can mimic the symptoms of depression and must be ruled out prior to depression management (American Psychiatric Association, 2020). Treatment possibilities include antidepressants, psychotherapy, and brain stimulation therapies, along with lifestyle modifications to promote mental and physical health (NIMH, 2018). Patient safety is key when treating depression and should be addressed with each appointment to ensure the patient is not experiencing thoughts of self-harm. If self-harm is a cause of concern, it is imperative to ensure patients and caregivers have a depression action plan in place and are aware of the valuable resources available for acute episodes of distress. Unfortunately, suicide rates continue to rise globally due to underdiagnosed and undertreated mental health conditions. In the U.S. suicide claimed more than 47,500 lives in 2019, making it the 10th leading cause of death overall (NIMH, 2021). Arkansas, however, ranked suicide as the leading cause of violent deaths for the state in 2017 accounting for 621 lives lost, which could have been prevented (BCBS, 2018).

Financial Impact

Untreated mental illness increases the economic burden and societal cost globally by loss of worker productivity, over utilization of medical services for preventable services, and an increase in substance use disorders (Breslow et al, 2019; Bowen et al., 2020; Alang & McAlpine, 2020) Adults with depression face unforeseen burdens affecting their overall wellness,

treatments, adherence, and socioeconomic standings resulting in a full standard deviation below the national average according to the National survey (Breslow, 2019). Burdens of health include decreased compliance, increased smoking, and biological dysregulation (Breslow, 2019). Versus burdens of non-health related factors including lower educational levels, interpersonal difficulties, unemployment, and homelessness (Breslow, 2019).

Depression affects the health care sector due to the prolonged treatments, frequency of visits, over utilization of emergency rooms for preventable services, and frequent exacerbation causing a need for acute care services. As of 2015, depression treatment in the U.S resulted in $17.4 billion which is an increase of 40% after adjustment for inflation from 1998 (Breslow, 2019). Expenditures for the uninsured decreased from 32% to 20% during this same time which may have been because of the Affordable Care Act which covers more underserved populations according to research (Breslow, 2019). Additional research found that Hispanic communities and patients with perceived language barriers never enrolled in the Affordable Care Act resulting in 2.6 million out of 10.2 million individuals never seeking insurance coverage (Lee & Harathi, 2016). Medical insurance is the single most important predictor for utilization of healthcare services due to affordability in primary care.

Commercially insured Americans in the United States receive a depression diagnosis at a rate of 4.4% (BCBS, 2018). This dramatic influx of depression since 2013 also carries a more than double price tag of $10,673 per insured patents compared to none depressed patients of $4,283 (BCBS, 2018). The increased price tag is a result of the more than 85% chance of patients having an additional serious chronic health condition in addition to their depression diagnosis. Arkansas depression rates are among the higher per state diagnosis rates at 5%, which is only 1% below the top-three states for depression rates (World Population Review, 2021).

Federally funded medical programs average depression diagnosis for patients older than 65 years old at a rate of 13% versus patients younger than 65 years old at an astonishing rate of 46.7% (CMS, 2017). Despite medical coverage, patients regardless of age reported trouble securing mental healthcare providers, acquiring prescription medications, and encountered absorbent cost burdens resulting in subpar depression management (CMS, 2017). Arkansas Medicaid enrollees reported mental illness at a rate of 30.5% versus U.S. average of 29.7% in 2018-2019 (KFF, 2021).

Inconsistencies and barriers to depression management

Worldwide, mental health disorders, especially depression, is known throughout healthcare as a missed opportunity as underdiagnosed and undertreated patients continue to overburden the unequipped mental health professionals and emergency departments. Depression rates increase annually, despite decades of collected patient data indicating patients are underdiagnosed and undertreated (Keeley et al., 2016). Forecasted to be the second leading disease burden globally by 2030 only behind HIV/AIDS, depression continues to overburden the emergency department that is least equipped to manage the mental health crisis long term (Keeley et al., 2016; Fleury et al., 2019; Molebatsi et al., 2020). Likewise, having low socioeconomic status equates to a 15.8% chance of suffering from depression (BCBS, 2018). Diagnosed but receiving no treatment, 65% of patients continue to struggle with depression symptoms on their own, whereas only 44% of patients will receive a combined medication and cognitive therapy approach to their mental healthcare needs (BCBS, 2018). Additional demographic data such as age, gender, race, and housing have resulted in inconsistent trends in relation to depression disparities (Panaite et al., 2019).

Frequenting the emergency department, the economically disadvantaged, and

unemployed mental health patients often present with headaches, sleep disturbances, gastrointestinal problems, and chronic pain as a chief complaint dismissing their mental health complaints all together (Fleury et al., 2019). Over utilization of the emergency department for long term treatment of mental health complications leads to adverse stigma labels and increased waiting times that exceed 8 hours in most instances for what is perceived as minimal care by most mental health patients. Despite longer wait times and suboptimal care perceived by patients, 37% of mental health patients utilize the emergency department as their primary source of mental healthcare due to convenience, degree of comfort, and perceived lack of other options (Fleury et al., 2019).

In conclusion, the World Health Organization (WHO) has been advocating for improved mental health services in the primary care sector to establish care for patients that was once perceived as unattainable due to low to middle economic standings since 1970 (Jordans et al., 2019). Currently, the COVID-19 pandemic has exacerbated the mental health and financial stability of most Americans resulting in an influx rate of mental health disorders. Hence, utilizing the primary care setting as the optimum source for mental health services due to limited mental health specialists and financial instability, has the perceived advantage of increasing depression diagnosis and services rendered. Detection and treatment outcomes remain suboptimal in non-specialized mental health facilities of primary care due to a lack of depression screenings and treating abilities (Jordans et al., 2019). Thus, utilization of the PHQ-9 questionnaire in the rural primary care setting may improve depression recognition, thereby diminishing the current gap in mental health services provided to patients outside of mental health specialists, resulting in the reduction of underdiagnosed depression rates.

Problem Statement

The problem statement for this DNP quality improvement project was that patients with depression concerns at a rural outpatient clinic in Arkansas were not being identified with depression screenings. Screening adults 18 years of age and older; is recommended as an evidence-based protocol for effective management of depression by both Centers for Medicare and Medicaid Service (CMS) and USPSTF published guidelines (Sinischalchi et al., 2020). Depression rates at the clinical site have increased dramatically since COVID-19 as identified by 100% of participants in the Needs Assessment. Key influencers expressed interest in instituting a depression protocol to address concerns, educational needs, and problematic clinic workflow processes.

Purpose Statement

The purpose statement for this DNP quality improvement project was to improve the identification of adult depression through the implementation of the depression screening tool, PHQ-9, upon arrival at the outpatient clinic in rural Arkansas. The PHQ-9 is the most utilized depression screening tool in primary care due to its availability and diagnostic accuracy (Levis et al., 2019). Current clinic practice requires patient self-reporting of symptoms for diagnosis and management. Thus, patients who do not communicate their mental health concerns were less apt to be diagnosed and treated for depression symptoms. The depression protocol included clinic staff education, depression screening recommendations, referral processes, scheduling and follow-up management of all patients identified as having depression according to the PHQ-9 questionnaire.

PICOT Question

In adult patients who present to a rural outpatient clinic in Arkansas (P), how does

utilizing a standardized depression screening protocol (I) compared to current practice (C) affect depression diagnosis, management, and referral rates(O) within 3 months of implementation(T)?

Needs Assessment

Objective

The objective of the Needs Assessment was to ascertain the current breakdown in depression management and potential barriers to the implementation of an evidence-based depression protocol applicable for all patients in an outpatient facility in rural, Arkansas through key informant interviews.

Participants

Key influencers in the Needs Assessment included administrative personnel and various health care professionals who influence the target group. The target group consisted of the clinic scheduler, register nurses, a medical assistant, and a phlebotomist who all participate in patient care at the outpatient clinic. The two key influencers identified at this clinic, both having over three years of service, provide experience and knowledge of the patient population as well as employee workflow and skill levels. Their titles and educational backgrounds were as follows: The Clinic Executive Director has an educational background in business and the APRN specializes in adult gerontology. The target group included a phlebotomist who has worked for the clinic for 5 years, a receptionist who has worked and volunteered for the clinic for 6 years, two registered nurses with 20 and 15 years of experience, and a medical assistant with 3 years of experience.

Rationale of the Needs Assessment

Depression rates from June 2020 were approximately three times those reported in the second quarter of 2019 due primarily to the Coronavirus disease 2019 (COVID-19) pandemic

(Czeisler et al., 2020). Mental health conditions have been challenged due to physical distancing, stay-at-home-orders, and financial strain brought forth by COVID-19. Depression is a common but serious mood disorder that can cause severe symptoms that affect how you feel, think, and handle daily activities, such as sleeping, eating, or working (NIMH, 2019). Depression can be linked to medications, illnesses, or the result of unique circumstances such as that of the pandemic. The US Preventive Services Task Force (USPSTF), The American Academy of Family Physicians, and The Centers for Medicare & Medicaid Services (CMS) all recommend screening adults, 18 years of age and older, for depression and combining screening with support systems and evidence-based protocols for effectiveness (Sinischalchi et al., 2020). Currently, the clinic has no policy or procedure for depression screenings. Relying solely on patients' self-reporting of depressive symptomology and providers' mental health skill in diagnosing and managing depression was the current practice. Cumulative data of the clinic's depression rates were unconfirmed due to the transit nature of the patient population, paper charting system, and absence of standard billing practices. Therefore, the Needs Assessment was utilized to establish a depression screening protocol with clear guidelines to address current pandemic levels of depression. The implemented protocol sought to improve depression recognition, diagnosis, management, and referral processes.

Data Collection Tool

The Needs Assessment used informative interviews to identify gaps in depression diagnosis, management, and referral processes within an outpatient clinic in rural Arkansas. Additional questioning focused on staff readiness for change, barriers of protocol implementation and additional educational needs. Questionnaires were formulated and presented to key influencers and the target group consisted of 15 open-ended questions. See Appendix K.

Sample, Sample Size, and Sample Procedure

Interview questions were formulated and presented via convenience sampling to two key influencers and five target group members who were chosen based on their knowledge of patient care and clinic flow. Interviews took approximately 10 minutes to conduct so as not to interrupt current workflow during open clinic hours from August 1, 2020, through February 10, 2021.

Implementation and Data Analysis

Questionnaires were administered in person and via phone during lulls in patient volumes due to participants' availability and preference of time. No preference or ranking was assigned to participants based on service years, job title, educational background, or employment status. Instead, participants were grouped according to their influential ability.

Interview results revealed that 100% of participants were interested in improving depression care as they see an increase in the need due to the influx of unidentified depression because of COVID-19. Only 57% of participants felt there was some stigma surrounding depression. Likewise, 57% of participants felt like patients received all the necessary tools for success with their diagnosis. Most participants were aware of the referral process for patients who meet the criteria for further therapy but only 43% of the participants thought they could accurately diagnosis depression. Drinking, drugs, and unemployment was established as poor outcomes for 42.8% of participants whereas isolation and suicide risk tide at 28.5%. Participants ranked scheduling at 42.8%, education 28.5%, referral and therapy both scored 14.2% in terms of what changes need to be made in depression management. An increase of depression rates was identified by all participants regardless of only 43% of participants feeling comfortable with seeing depression symptoms. All participants were receptive to changing with the new screening tool. Participants viewed scheduling as the major hurdle to overcome resistance to change 57%

of the time and implementation or patient compliance 43%. Data utilization addressed concerns, resistance, educational needs, and problematic clinic workflow processes when identified.

Aim and Objectives

The aim for this DNP quality improvement project was to improve the identification of depression in at-risk adult patients through the implementation of a depression screening protocol utilizing the PHQ-9 questionnaire at an outpatient facility in rural Arkansas. Following protocol implementation, the project expected to increase the number of patients identified, treated, and managed for depression symptoms from 5% to 50% by March 2022 (Maurer et al., 2018). The objectives were as follows:

- To identify at-risk patients utilizing PHQ-9 depression screening during admission in a primary care practice
- To evaluate follow-up care of patients diagnosed with depression following the depression protocol implementation
- To analyze results with the intent to provide recommendations to improve depression services

Review of Literature

A review of literature was conducted to find evidence-based research articles related to depression management, screenings, and treatment in primary care utilizing the PHQ-9 depression questionnaire. The search was completed using the key words depression, PHQ-9, low income, and treatment. The detailed search strategy was conducted along with Dr. Tony Stankus utilizing the following databases: MEDLINE Complete, APA PsycArticles, APA PsycInfo, Google Scholar, Web of Science, UpToDate, the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), and the American Depression Society.

The inquiry was limited to peer-reviewed articles, journals written between 2016-2021, adults 18 years and older, written in the English language and studies performed in the United States. Inclusion criteria were studies that exemplified depression management strategies, low economic status, gender, age, race, living conditions, screening tools, comorbid conditions, medication management, and primary care treating mental health. A total of 58 applicable articles were utilized following the inclusion and exclusion criteria listed above. See Appendix D.

Collaborative Healthcare Approach

The utilization of a collaborative care approach enhances evidence-based depression management services for mental health care (Karam et al., 2018; Berge et al., 2017; Keeley et al., 2016; Kaltman et al., 2019). Health care continues to evolve as new advances continue to emerge, resulting in multiple subspecialties. As such, it is almost impossible for one medical care provider to have adequate knowledge and understanding of each complex specialty outside of their specific training, even health care providers that are considered general healthcare practitioners. Thus, collaborations between providers and organizational collaborations exist as a move towards an operational community-based healthcare system of cost efficiency, reduced redundancy, and greater value (Karam et al., 2018; Berge et al., 2017).

Research suggests that collaborative care models, system level modifications, and introducing behavioral health care services into the primary care setting as a means for prompt preventative care and treatment solutions to circumvent the growing depression rates and limited mental health specialist is the revolutionary future of depression management (Berge et al., 2017). By facilitating primary care visits into mental health enabled services through warm hand-offs, paired visits, preventative visits, and treatment-focused visits the provider, transitions the patient from primary care to mental health care provider or specialist (Berge et al., 2017). The

pilot study transforming the Broadway Family Medicine Clinic in Minnesota successfully implemented such behavioral pathways into a low-income and minority population clinic by improving mental health transitional services, reducing hospital readmissions, and reducing therapy drop out from 60% to 30% (Berge et al., 2017).

Additionally, collaborative care models can facilitate expanded depression screening, provide precision with diagnosis, and improved evidence-based utilization of medication and psychotherapy approaches to mental health services in the primary care setting (Kaltman et al., 2019). Facilitating communication between the primary care practitioner and consulting psychiatrist, the care manager, assists with assessments, coordination of care, follow up appointments, environmental needs, and medication assistance (Kaltman et al., 2019). Multiple reviews have proven the positive effects of collaborative care models for improving depression symptoms, adherence to care, and patient satisfaction (Keeley et al., 2016; Kaltman et al., 2019). The largest collaborative depression care study as of 2015, the DIAMOND trial, reported no clinically significant impact, but results were attributed to provider perceived buy in (Keeley et al., 2016). This study is mentioned as the only oppositional research study for collaboration care model. Opposition is fundamental to all research ensuring all data is quantified accurately as to not skew findings.

Practitioner Mental Health Training

The integration of mental health services into the primary care setting is the ideal solution to strengthen patient centered, evidence based, sustainable care according to the World Health Organization (WHO, 2021). Providing services to over 85% of the mental health population primary care practitioners supply comfort, prior established trust, and less stigmatized depression centered support to their already established patient population (Lauria- Horner et al., 2018;

Keeley et al., 2016). Current research estimates that only 20% of patients will receive adequate treatment with a depression diagnosis due to their own perceived barriers (Lauria-Horner et al., 2018). Strategies and training modules implemented to boost primary care provider skills and adequacies with mental health recommended guidelines has led to inconsistent findings due to the complexity of the mental health diagnosis (Lauria-Horner et al., 2018). Likewise, both the meta-analysis by Sikorski et al. (2012) and the Cochrane review by Huibers et al. (2007) deduce to the diminished effectiveness of teaching basic psychotherapy to providers in primary care, citing barriers of perceived clinical utility, time restraints, provider perceived proficiencies, and usefulness. Sikorski et al. (2012) cited a need for improved organizational structure and collaborative care models for improvement whereas, Huibers et al., (2007) adduce the lack of evidence in primary care providers delivering psychotherapy as the main implication for diminished effectiveness.

Inspiring Practitioner Training

Professional development is an important aspect of every licensed healthcare provider's career. As the medical system branches into additional subspecialties the general practitioner must adapt to the changing societal demands and levels of expertise (Van der Burgt et al., 2018). This continuous adaptation of up-to-date professional competence and performance for personal growth or licensure requirement can be overwhelming to the practitioner. Thus, provoking motivation for continuation of training outside of the current specialty is of current interest for all continuing education programs. To inspire the primary care provider to obtain knowledge in mental health requires training motivation in the personal growth category as a subspecialty. According to Van der Burgt et al. (2018) practitioner motivation is achieved if attention to autonomy, competence, and relatedness is upheld. Providing support and knowledge to the

practitioner through the practice transition has the perceived benefit of sustainability of proficiency (Van der Burgt et al., 2018). Traditional continuing medical education (CME) is provided through passive educational modules in which the learner has limited involvement, interaction, and reflection with the educational materials provided (McMahon & Skochelak, 2018). Renovation of the passive learner CME to a model in which the practitioner is included in a high-quality team care learn environment has shown to be more beneficial and functional for stainability of health care delivery (McMahon & Skochelak, 2018).

Motivational Interviewing

In 1983 William Miller introduced motivational interviewing to understand drinking behaviors (Frost et al., 2018). Further development in the 1990s led to a "collaborative conversation style" in which the individuals' motivation and commitment to change was further explored through four overlapping processes (Frost et al., 2018). The processes included engaging in a working relationship, focusing on the problem that needs to be changed, evoking one's desire to change, and then following through with the planning stages of change (Frost et al., 2018). The straightforward counseling approach that is relatively simple to master and is applicable to a broader range of mental health disorders could address provider buy in, thus improving outcomes (Keeley et al., 2016). Research suggests, motivational interviewing (MI) boosts individual patient motivation by reinforcing self-expressed language while avoiding or de-emphasizing the negative or argumentative language sustaining depressive mood within the directive hypothesis theory (Keeley et al., 2016). The conflict resolution hypothesis theory explores both sides of the patient's dilemma, thereby initiating the resolution to the problem resulting in a change in the patient's overall demeanor (Keeley et al., 2016). The relational hypothesis in which the provider displays empathy towards the patient and therefore directing

influence over the patient's direct problems (Keeley et al., 2016). This effective and generalizable treatment option helps with antidepressant adherence and cognitive behavioral based therapy. The systematic review by Frost et al. (2018) reported that while motivational interviewing can be beneficial for evoking change within a specific patient population specificity is needed for improved consistent effects. Thus, to standardize this intervention delivery method, development of the Motivational Interviewing Network Trainers (MINT) and the Motivational Interviewing Treatment Integrity Code (MITI) occurred over the past 10 years to provide more consistencies across health and social outcomes (Frost et al., 2018).

Comparative outcomes with the collaborative care approach, motivational interviewing (MI), struggles to be effectively integrated into primary care due to provider buy in and time constraints (Keeley et al., 2016). Research suggests patient improvement is based upon the self-determination therapy (SDT) in which a patient is more willing to initiate and continue care if they perceive care was initiated per their request (Keeley et al., 2016). Thus, MI has descriptive characteristics of a self-directed, client-centered counseling style eliciting mental health changes through the exploration of personal feelings of uncertainty to gain motivation and commitment for resolution-based therapy (Keeley et al., 2016). When applied to high-risk populations such as post hospitalized acute coronary syndrome patients in the study by Huffman et al. (2019) MI, along with positive psychology (PP) was associated with increased well-being and physical activity. Likewise, when PP-MI was utilized on type 2 diabetic patients who have a known history of noncompliance leading to poorer outcomes the study by Huffman et al. (2021) shown an increased compliance level in physical activity, positive psychological well-being, and self-efficacy.

Patient Health Questionnaire-9

Utilization in Primary Care

The Patient Health Questionnaire-9 (PHQ-9) is the most widely used instrument developed to screen patients for depression and suicidal ideation in the medical setting (Levis et al., 2019). This 9-item questionnaire is frequently utilized in primary care as a patient self-reported screening tool because no additional mental health training or statistical knowledge is required prior to administering to patients (Shin et al., 2019; Levis et al., 2019). Developed and copyrighted by Williams and Kroenke in 1999, the PHQ-9 questionnaire is available for replication in over 30 languages free of charge from Pfizer, Inc. Thus, the PHQ-9 questionnaire can be adapted for use in various culturally diverse populations as a tool to facilitate conversations about depression and mood leading to improved performance and monitoring of symptomology outcomes (Farnbach et al., 2019). Additionally, the PHQ-9 questionnaire can be quickly administered and scored in the clinical setting with the user-friendly scoring indexes providing depression severity levels for improved patient monitoring (Sahni & Agius, 2017). The PHQ-9 has been highly effective in terms of diagnosis in high-risk patients who suffer from chronic conditions but is still not a standalone independent test for depression diagnosis (Sahni & Agius, 2017). The systematic review by Costantini et al. (2020) recommends the importance of provider training and open communication lines with patients to prevent misinterpretation, increase detection, and deepen the patient's understanding of their illness when utilized in the primary care setting. When applied across sociodemographic groups within the U.S. the PHQ-9 questionnaire provided meaningful comparisons in total cognitive/ affective, and somatic depressive symptoms lending its usefulness to larger communities (Patel et al., 2019).

Scoring PHQ-9

Originally developed as a detection measure for five mental health disorders, the PHQ questionnaire now is primarily used to screen for depression, anxiety, and somatoform disorders (PHQ, n.d.). Derived from the Primary Care Evaluation of Mental Disorders (PRIME-MD), the PHQ questions mirror the diagnostic criteria set by the DSM-5 manual (PHQ, n.d.).

PHQ-9 severity measures range from 0 to 27, as each of the 9 questions has a potential score of 0 (not at all) to 3 (nearly every day). Major depression is assessed further if the patient has at least five of the 9 depressive symptom criteria present for "more than half the days" and one symptom of depressed mood (PHQ, n.d.). Additional clinical considerations following scoring of the PHQ-9 questionnaire include ruling out current symptoms triggered by psychosocial stressors, duration, treatment received, extent of impairment, history of similar episodes, and family history of similar conditions (PHQ, n.d.).

Utilizing the PHQ-9 screening tool, administered often by non-mental health professionals, requires the needed awareness of how to properly recognize suicidal ideation and how best to provide treatment for these patients that are at increased risk (Shin et al., 2019). Research is not conclusive with a score of 1 point or higher on item 9 as only a small percentage of studied participants demonstrated actual suicidal ideation or had suicide plan in place when further questioned about item 9 (Shin et al., 2019).

Psychometric properties

The 2015 meta-analysis evaluating the specificity and sensitivity of the PHQ-9 recognized the cut-off score between 7-15 as identified by the 36 studies and 21,292 participants reviewed (Levis et al., 2019). The standard cut-off score of 10 maximized the combined sensitivity and specificity compared to mini structured diagnostic interviews that most closely

replicate the PHQ-9 screening scale. However, in the primary care setting the provider must be aware that half of all screened patients will have a false positive report with the cut-off score of 10 (Levis et al., 2019). A web-based tool is now available to help the provider estimate the outcomes due to high false positive results. Research suggest that the Spanish version of the PHQ-9 requires a high standard cut-off score to rule out the high false positive results. According to Munoz-Navarro et al. (2017) increasing the cut-off score to 12 resulted in the same sensitivity and specificity as compared to English PHQ-9 versions.

In conclusion, the DNP quality improvement project provided sufficient evidence in support of depression screening tools in the rural primary care setting as an approach to improve mental health services for the economically disadvantaged patients of rural Arkansas. Current barriers to depression screenings in rural primary care found during the literature review were addressed during the creation and implementation phases of this DNP quality improvement project. The depression screening tool improved depression recognition and services while also promoting patient safety, improving patient outcomes, patient satisfaction, and access to mental health care services in the rural primary care sector.

Theoretical Framework

This DNP quality improvement project was designed to improve depression recognition through the implementation of a depression protocol targeting adult patients presenting for care at a rural outpatient facility in Arkansas. Havelock's Change Theory of 1973 was utilized as a guiding force through the implementation, development, and PHQ-9 questionnaire integration stages within the clinical site. Adapting Lewin's model of change from three phases to six, Havelock's Change Theory includes knowledge building within the additional three stages to respond more effectively to real-life situations (Udod & Wagner, 2018). In addition, research

suggests that any intended innovation may not succeed long term or be reproducible without the guidance of an adequate change theory despite initial improvement in patient outcomes and staff's willingness to change (UKEssays, 2018). Thus, the planning and monitoring stages within Havelock's theory provided a more fluid approach to change, which parallels current clinical practice. Patient management following a positive PHQ-9 screening utilized evidence-based research as the basis for further treatment. Lastly, the maintenance and change stage of Havelock's theory included an evaluation of project sustainability. For sustainability of change and improvement outcomes, it is vital to continually evaluate protocol outcomes and make the needed adjustments deemed appropriate to stay current and relevant with treatment guidelines. See Appendix E for the theoretical framework model and Appendix F for the concept map.

Havelock's Theory of Change

Havelock specified the need for a change agent as the guiding force to promote change. The roles of the change agent include being the catalyst, solution giver, process helper, and resource linker (Chance & Chance, 2002). As the catalyst, the change agent pushes for innovation by interrupting current workflow processes evoking change among fellow team members. The solution giver delivers expertise knowledge in problem solving and conversion activities, whereas the process helper assists with the implementation of the problem-solving operations directly. Finally, the resource linker gathers all resources needed to bring about change to meet the needs of the organization.

In addition to the change agent, Havelock's Theory requires the planned innovation to consider the two viewpoints of change. The first viewpoint to consider is the view of the people who were asked to change. Change is brought about by simple reflex, rational problem-solving methods, or simply by avoidance of the perceived problem noticed, whereas the viewpoint of

those individuals who were attempting to bring about change requires the utilization of a change agent to bring about organized changes (Havelock, 1973). Havelock's Theory of Change (1973) is composed of six steps that interconnect to bring about clinical practice change.

Havelock's Theory of Change Stages

Stage One: Building a Relationship

The first stage builds relationships between the change agent and the desired organization. This step is essential to bring about change as change can be met with resistance as fear and insecurities grow among staff members. With existing loyalty and relationships comes experience of clinical insufficiencies, barriers to change, available resources, and increased collaborative networks that can either hinder or promote change within the organization (Hvelock, 1973). The collaborative relationship between the clinical site and this DNP project has been well established with previous clinical experience gained over the past year.

Step Two: Diagnosing the Problem

The second stage improves depression screenings in primary care by recognizing the problem followed by implementing universal screenings as an effective means of managing underdiagnosed and undertreated depression (Jin & Wu, 2020). Recognizing a gap in depression management went beyond simply determining that additional depression screenings were needed. Specific goals and aims were identified to overcome barriers to screening and follow-up care with mental health services as identified by the Needs Assessment.

Step Three: Acquiring Resources for Change

Throughout the change processes, adequate understanding of existing resources, printed material, people, and goods guaranteed that sensible decisions were made regarding use, acquisition, and preservation measures (Havelock, 1973). An internal assessment in the form of a

Needs Assessment was utilized to acquire current availability of resources. Likewise, an extensive literature review was performed to evaluate current depression recognition guidelines.

Step Four: Selecting a Pathway for the Solution

The fourth step to Havelock's Theory is to finalize a pathway for the discovered problem (Havelock, 1973). Designing practice changes requires current evidence guidelines, research current findings, and dissemination of found problems to key stakeholders for consideration. Taking into consideration the perceived benefit, practicability, and infusibility of the suggested practice change solution before new clinical processes and patient outcome measures were uncovered (Havelock, 1973). Stakeholders have chosen to utilize CMS and USPSTF guidelines as a current pathway for depression screening within the clinic due to increased research publications.

Step Five: Establishing and Accepting Change

Establishing change and acceptance requires frequent outcome evaluation and open communication between principal investigator, staff, and stakeholders through both planned and impromptu meetings. Stakeholder's involvement was crucial to the planning and implementation of practice change, providing confidence, and leadership for future feasibility of change. Educating staff regarding practice changes and the protocol for depression following PHQ-9 screening become the new standard of care. Thus, frequent open communication was required in the form of impromptu meetings, scheduled meetings, and evaluations ensuring change was applicable to current wants and needs.

Step Six: Maintenance and Separation

The final step of Havelock's Theory of Change is maintenance and separation which means the change implemented was deemed sustainable (Havelock, 1973). Results of this pilot

study were evaluated for feasibility and integration of new practice guidelines within the clinic's standard of care. The evaluation processes produced favorable patient outcomes and clinical workflow processes recommendations were communicated to stakeholders. Staff education regarding practice change and the protocol for depression screening has become the new standard of care. Thus, the practice implemented during the change process has become the new standard of care and continued monitoring by the change agent is no longer required (Havelock, (1973).

Evaluation of Outcomes

The aim for this DNP QI project was to improve depression recognition by creating a depression protocol implementing the PHQ-9 questionnaire to improve depression screening at an outpatient clinic in rural Arkansas. Following the implementation period, data collection to determine the rate in which the depression protocol increased depression recognition, follow-up care, and cost effectiveness was evaluated. Comparative depression data was collected in the form of chart reviews to analyze the effect of change implementation. Specific outcome measures to evaluate the intervention's effectiveness included positive screening, depression diagnosis, follow-up care, depression referrals, safety of care, and cost benefits.

Implications for Practice

In conclusion, Havelock's Theory of Change (1973) was utilized to create and implement change at an outpatient facility in rural Arkansas through the creation of a depression protocol following a positive screening gathered from the PHQ-9 questionnaire. The changes implemented reflect current guidelines utilizing EBP recommendations that have provided favorable depression outcomes, improved depression access to care, patient satisfaction, and cost effectiveness. The current clinical problem was identified, a Needs Assessment was finalized,

and an extensive review of literature was performed evaluating current depression EBP guidelines. Afterwards, a research design was established along with stakeholder input prior to implementation of the pilot study. The pilot study resulted in a successful change with improvements noted in depression recognition and management. Thus, the protocol was in the beginning stages of being officially integrated into the clinic's current standard practice. Utilizing Havelock's Theory of Change (1973) as a catalyst to promote change through relationship building, problem diagnosis, resource gathering, finding a solution, finding acceptance and self-renewal processes to claim sustainability of change was maintained.

Methodology

Project Design

The DNP quality improvement (QI) project utilized a quasi-experimental research design focused on increasing access to depression care through the implementation of a depression protocol that follows the PHQ-9 questionnaire at an outpatient facility in rural Arkansas. The quasi-experimental approach allows the researcher to measure the change in patient outcomes following the implementation phase of a treatment or intervention in the clinical setting, but it does not require randomization or a control group (Moran et al., 2017). Randomization utilization was not feasible due to the high fluidity attendance rates of the low-income no insurance clinic; thus, a quantitative quasi-experimental design approach was most appropriate for the patient population being studied. Potential participants were chosen upon arrival at the rural primary care clinic, regardless of services rendered, via convenience sampling. The capacity of this project's data collection was approximately 1,500 rural primary care visits within the three-month data collection period.

The DNP project utilized a pre- and post- implementation phase for comparison (Melnyk & Fineout-Overholt, 2015). Pre-implementation data consisted of an extensive paper chart review gathering demographic data, depression diagnosis, and depression management of all patients seen within the clinic over a 12-week period leading up to the implementation phase. The post- implementation phase included all data gathered during the implementation phase in which the administration and collection of the PHQ-9 questionnaire along with patient demographic and depression management data was collected over a 12-week period. The demographic and depression data gathered from the chart review was then compared to the patients who screened positive, score 10 or above, on the PHQ-9 questionnaire and the follow-up care that was provided.

The desired effect of the project was to improve depression recognition and services provided by implementing the depression screening protocol following admission into the rural primary care clinic. With successive implementation, the project increased the percentage of patients receiving depression services in the rural primary care setting. Objectives of the project included the utilization of the PHQ-9 to determine patients at need for depression services, depression management, and depression referrals as warranted. The project illustrated the impact depression screening had on patient access to care, patient safety, patient outcomes, and cost savings in the rural primary care sector. The project goals aligned with the clinical site's objectives and project objectives to increase depression recognition and services in the rural primary care setting. The length of the DNP project, which included implementation and data collection, occurred over a six-month period.

Project Description

The purpose of QI research included eliminating errors, deceasing sentinel events, improving patient care and safety, decreasing financial cost, promoting health, and focusing on patient-centered care, which this DNP project most closely aligns its premise (Moran et al., 2017). More specifically, the purpose of this QI was to improve upon current research utilizing a specific population to quantify perceived improved patient outcomes. The QI project monitored the utilization of an evidence-based depression screening protocol following admission into a low-income rural out-patient clinic. Improvement in depression recognition and depression services rendered were identified which could positively impact the financial burden of depression on the patient population studied with additional research. More importantly, the project established a standardized approach for screening, diagnosing, and managing patient depression symptoms that was consistent with the facility's new standard of care.

Setting

The DNP QI project transpired in an outpatient facility within rural Arkansas. This facility provided quality primary care to the economically disadvantaged residents of Arkansas and Oklahoma, such as the uninsured and those living below the poverty line. The project was implemented in the rural primary care clinic, excluding patients only if they presented for dental and vision services within the same clinical area.

Study Population

The study participants included all adult patients presenting for primary care services within the three-month chart review and three-month protocol implementation phase who met the clinic patient registration requirements. Patient eligibility requirements included patients over the age of 18 years old, no current health insurance coverage, photo ID, proof of income, and

proof of Arkansas or Oklahoma residence. Sample size was unknown due to the transient nature of the patient population. On average the clinic provides care to approximately 500 patient visits monthly, thus this DNP project expected an approximate 1,500 participants completing the PHQ-9 questionnaire within the three-month implementation phase. A clinic wide practice change required all providers and staff members' participation in this QI project.

Subject Recruitment

All patients meeting the clinic's admission guidelines were screened using the PHQ-9 questionnaire upon arrival at the facility. Retrospective data was collected via an extensive paper chart review of all patients seen in the clinic during October 1, 2021, through December 1, 2021. Additional consent forms to participate in this DNP study have been waived by both the University of Arkansas Institutional Review Board (IRB) and Clinical site.

Consent Procedures

The DNP QI project implementation phase has established the new standard of care for depression screenings for this clinic. All patients signed a consent form along with a release of personal information document through the admission process. Of note, this facility already informs patients that students practice under the direct supervision of a provider prior to admitting patients into the practice. Therefore, only verbal consent to participate in this specific QI project was required beyond admitting clinical consent forms to establish care with the clinic.

Study Measures

Conceptual Definitions. Concepts discussed for this DNP project included depression, depression screening, depression management, and low-income community clinic. For this project, depression was defined by the DSM-5 definition which, is also known as major depressive disorder or clinical depression (American Psychiatric Association, 2013). DSM-5

definition of depression: The individual must be experiencing five or more symptoms during the same 2-week period at least one of the symptoms should be either depressed mood or loss of interest or pleasure. Symptoms include:

- Depressed mood or sadness most of the day, nearly every day.
- Markedly diminished interest or pleasure in all, or almost all, activities most of the day, nearly every day.
- Significant weight loss when not dieting or weight gain or decrease or increase in appetite nearly every day.
- A slowing down of thought and a reduction of physical movement (observable by others, not merely subjective feelings of restlessness or being slowed down).
- Fatigue or loss of energy nearly every day.
- Feelings of worthlessness or excessive inappropriate guilt nearly every day.
- Diminished ability to think or concentrate, or indecisiveness, nearly every day.
- Recurrent thoughts of death, recurrent suicidal ideation without a specific plan, or a suicide attempt or a specific plan for committing suicide (American Psychiatric Association, 2013).

The low-income community clinic was defined as a clinic who accepts patients living at or below the poverty line who were not eligible for or do not receive private or commercial insurance benefits. Depression screening was the process of screening or testing for depression. Depression management was defined as the management of depression utilizing pharmacologic and non-pharmacologic modalities.

Operational Definitions. Depression screening only involved the utilization of the PHQ-9 questionnaire for this DNP project purposes. Depression was operationally defined as a PHQ-9

score of 10 or higher. Depression management encompassed any services or care provided to patients for their diagnosis of depression. Services for depression included pharmacological management, cognitive therapy, follow-up care, laboratory test, and referrals for further mental health services. See Appendix J for data collection sheets and Appendix L for PHQ-9 scoring and related diagnosis.

Outcome Measures. The outcome measures of this DNP project were utilized to analyze the impact of the evidence-based practice change that was implemented (Melynk et al., 2015). Addressing the project's specific aim and clinical outcome measure, the percentage of patients completing the depression protocol following a positive screening utilizing the PHQ-9 questionnaire was measured. A retrospective chart review was conducted three months prior to the implementation phase of this DNP project collecting demographic data, number of patients diagnosed with depression, depression management, and the referrals provided to each patient seen in the primary care clinic.

Additional outcome data to be evaluated included the comparison of pre- and post-implementation data detailing medication management, follow-up appointments scheduled, cognitive therapy scheduled, and referrals completed. Percentages and projected goals for these patients centered outcome measures were unknown at the start of this project. Anonymity was upheld through data collection efforts due to sensitivity of patient information and the Health Information Portability and Accountability Act (HIPAA).

Process Measures. The Plan-Do-Study-Act (PDSA) cycle encompassed the process measures of this DNP project. To address efficiency of the DNP project implementation phase, the PDSA cycles analyzed and modified changes when problems in processes arose (Melnyk & Fineout-Overhold, 2015). I monitored the compliance and process observations biweekly.

Process measures monitored for the DNP project included the percentage of adherence to the patient depression screening checklist established to determine the patient flow throughout the clinic. The current rate of depression screening utilizing a tool in the primary care setting is approximately 5% nationally (Douglas et al., 2018). The goal for this pilot study was to increase rural primary care depression screening rates to 50% or more patients screened per day for depression by March of 2022 in the rural outpatient clinic.

Balancing Measures. Both positive and negative unintended effects of this DNP project implementation were evaluated utilizing balancing measures. Balance measures for the DNP project included patient follow-up appointments, pharmacological interventions, cognitive therapy, referrals, and depression diagnosis rates. Descriptive statistics were gathered on each balance measure along with run charts to monitor change over the duration of the implementation phase. The current state of the clinic's balance measures prior to implementation as identified above is unknown.

Benefits and Risks

The benefits of this DNP project included the translation of an evidence-based practice model introduced into the primary care setting to improve depression recognition. The benefits of depression screenings in primary care included improved access to mental health care services, prompt diagnosis and treatments leading to improved patient outcomes, decreased disparities for the economically disadvantaged, and decreased out of pocket expenses for acute care or specialist visits (Keeley et al., 2016; Fleury et al., 2019). Additional benefits to depressions screenings in the rural primary care setting included the patients comfort level with their current provider was already well established and documented making transitions to treating mental health disorders such as depression an easier transition for the patient. The DNP

project's implementation of the PHQ-9 questionnaire into current standard of care guidelines for the clinical site had minimal risks, as patients were providing self-reported knowledge of current feelings. However, emotional distress related to screening questions and high false positive rates of the PHQ-9 scores in the rural primary care setting could cause undue stress on the patient or cause a misdiagnosis if proper follow-up provider assessments were not preformed (Levis et al., 2019). Thus, provider assessments following the PHQ-9 were promptly provided to each patient who scored 10 or above. Potential loss of the patient's privacy and confidentiality through data collection processes were minimal. I ensured all necessary precautions were in place to minimize the loss of privacy and confidentiality by upholding HIPAA guidelines.

Subject Costs and Compensation

There was no additional cost incurred by the patients during this DNP project outside of the scheduled visit. Compensation of patients was not permitted during this DNP project to ensure data collection efforts were not coerced.

Resources Needed and Economic Considerations

Minimal costs were associated with the implementation of this DNP project. As the only additional cost incurred was printing the PHQ-9 survey on the back side of the patient's admission sheet, writing instruments, and three laminated copies of the procedure checklists. Additional resources that were gathered and utilized during this DNP project included my personal laptop as a source of data collection through Microsoft Excel and a USB drive to store data securely.

Implementation

Study Interventions

The DNP project intervention was the implementation of a depression screening following registration at an outpatient facility in rural Arkansas. The depression protocol has been constructed based on current need and evidence-based practices as a collaborative effort between project stakeholders, clinical staff, and I (Kaltman et al., 2019). Validity and reliability of the PHQ-9 questionnaire, within the primary care setting, is found to have sensitivity and specificity of 0.94 and 0.88 respectively when the cut-off-score of 10 is utilized (Levis et al., 2019). The provider conducted a patient evaluation of depression symptomology to rule out false-positive PHQ-9 screenings as needed. When a patient's PHQ-9 score and provider evaluation revealed that they had depression, depression education, and treatment options such as pharmaceutical management, cognitive therapy, or specialist referral were discussed. See Appendix I for depression decision tree, Appendix B for the depression screening protocol, and Appendix P for implementation evolution over time

Pre- Implementation Phase

During the pre-implementation phase, multiple interdisciplinary team meetings were held to discuss existing and potential practice changes. Change strategies were based on Havelock's theory of change. Two project teams were formed to serve as a catalyst for problem identification, resource procurement, education, and staff approval, as well as to foster links and communication between staff and myself. One team was made up of office personnel, while the other was made up of clinical personnel. From the administration of the PHQ-9 surveys to the coordination of follow-up depression management after a positive screen, key stakeholders were involved in the development and implementation stages of this DNP project. During the pre-

implementation phase, a comprehensive flowchart of how patients flow through the clinic from registration to discharge was created, noting the involvement of staff members at each transition check point. The workflow recommendations were taken into consideration along with the clinic's layout, staffing, and current Centers for Disease Control (CDC) recommended guidelines during the COVID-19 pandemic. Throughout the pre-implementation phase, inter-professional teams were formed to give assistance and improve communication between all members of the staff and myself. Because the needs assessment revealed a breakdown in present staff communication levels, assessing communication dynamics was critical for assuring the transition to implementation would be a success. To develop open communication channels between registration, nursing staff, and providers, specific team members were recruited. See Appendix B for process flowchart, Appendix I for depression decision tree, and Appendix B for depression screening protocol.

Following the development of new depression screening and follow up guidelines tailored specifically for this clinic, I established regular clinical meetings to discuss current depression findings, new clinical processes, current EBP describing safety and efficacy of the proposed intervention, the projected implementation date, and new procedure guidelines. I ensured that transfer of processes was conducted efficiently with existing expectations and goals of implementation by prioritizing staff queries and concerns at each staff meeting.

Following IRB approval on December 15, 2021, a chart review collecting data throughout a three-month pre-implementation phase was immediately started. Demographic data, depression diagnosis, follow-up care, and the number of referrals provided on all patients within the defined time rage of October 1, 2021, through December 30, 2021, were collected as baseline data to be compared with post-implementation results.

Implementation Phase

The implementation of a depression screening was approved by key stakeholders and clinical staff members before the DNP project proceeded to the implementation phase. Havelock's Theory of change stresses the importance of establishing trust and acceptance at each pivotal stage in the change idea to further promote confidence, leadership, and the feasibility of change (Havelock, 1973). Each patient who met the financial requirements to be seen in the clinic for medical treatment was asked to take part in the depression screening. The PHQ-9 questionnaire was handed to new and existing patients during the registration process to complete in the waiting room area, but due to adherence concerns noted in the PDSA cycle, it was eventually completed during the triage phase. The PHQ-9 scores range from 0 to 27, with 0 being the lowest and 27 being the highest. Each patient completed the PHQ-9 questionnaire prior to a physician depression assessment to rule out or confirm a depression diagnosis. The depression decision tree can be seen in Appendix I. Staff were instructed to continue with routine clinical appointments if the patient screened negatively with a score of 9 or below and has no history of depression or depression therapies documented in their medical records. Similarly, all patients who scored positively with a score of 10 or above with a negative provider screening were provided depression education, scheduled for future depression exams, and then returned to their regular clinical visit as scheduled. Alternatively, patients who scored 10 or above and had a positive provider screening, on the other hand, were given education, medication, and/or cognitive therapy, depending on the severity of their symptoms, provider guidance, and patient request, before returning to their regularly scheduled visit. Exceptions were made for patients who were deemed to be in crisis and needed immediate referral to a crisis center or emergency

facility due to risk of causing harm to themselves or others. See Appendix I for the depression decision tree and Appendix L for PHQ-9 questionnaire and scoring.

The progress of the DNP implementation phase was checked biweekly to ensure that screening methods and depression treatment services were being used efficiently and correctly. The routine data collection in process management and patient chart reviews produced quality control measures to further implementation success. Deviations in the DNP project were made along the way to improve processes and data collection efforts in the PDSA cycle resulting in stakeholder input and improved data analysis. See Appendix J for data collection sheets.

Plan-Do-Study-Act Cycles

During the implementation phase, it was critical to use the Plan-Do-Study-Act (PDSA) cycles to address all difficulties that arose in real time. The analysis of biweekly data trends allowed for immediate changes to present healthcare processes as a means of improving implementation tactics. With a goal of increasing the percentage of depression screening in the primary care setting from the current national average of 5% to 50% or more by March 2022. The overall goal of increasing depression screenings utilizing a screening tool was surpassed and maintained throughout the duration of the implementation phase starting with week 4. Achieving a 100% adherence rate was achieved as well but not maintained throughout the entire project due to changes in staff positions and influx of volunteer coverage.

Additional findings of the PDSA cycle included the identification of barriers that could have caused deviations in the collected data, process flows, and overall outcome of the project. Barriers included staff shortages, inclement weather causing clinic closures, COVID quarantine of staff members, depression bias, increased voluntary staff, and student presence at the facility. The most substantial barriers included a breakdown in staff communication, adherence levels,

and provider engagement to depression screening and utilization of the depression decision tree. During the implementation phase, the following concepts were discovered and addressed utilizing PDSA cycles. See Appendix Q for detailed PDSA cycles.

Staff communication

All improvement initiatives were built on the foundation of effective communication. Because this facility relies significantly on volunteer employees, it was critical to assess their written and verbal abilities as a group. A breakdown in staff communication between front office staff members, clinical professionals, and substantial volunteer/student turnover was discovered during the pre-implementation period. To address these issues, prospective volunteers/students were urged to attend communication orientation courses to improve their communication skills. In addition, staff meetings were held on a regular basis to discuss methods to improve clinic communication and reduce depressive bias in this DNP project. Bridging the communication gap between intrapersonal and interpersonal communication about depression bias was viewed as an effective way to enhance patient depression screening, rates, patient scheduling, depression education, and staff adherence to depression screening guidelines.

Patients Adherence

Patients presenting for care were frequently found to be non-compliant with completing the surveys given to them at admission during the implementation phase. Several staff meetings and randomized patient polls were completed to discuss barriers and solutions to improve patient survey completion rates. Increased depression communication, education, and addressing social stigma surrounding depression inside the clinic boosted patient participation and buy-in.

Staff Adherence

During the implementation phase, it was discovered that staff adherence to the depression protocol was not being followed properly in the first three weeks of this DNP project. Employees reported feeling burned out, exhausted, and stressed because of multiple staff changes, shortages, and procedure modifications. As a result, less than half of patients presenting for care completed their depression screening. Open communication and process adjustments were considered and created to improve employee workflow and morale. Screening rates improved and clinical staff responsibilities were reduced by involving nursing students in the process of completing depression questionnaires verbally and providing depression education. With the addition of volunteer personnel, improved staff communication, and renewed staff confidence, staff adherence to the depression protocol increased.

Provider engagement

During the implementation phase, the use of a depression decision tree was initiated as a series of steps to be followed, after a positive PHQ-9 and provider assessment. Efforts made to increase the use of the depression decision tree included providing education of effectiveness and use; providing multiple copies in convenient locations to remind providers of use; work emails reminding providers of the new depression protocol to be utilized in the clinic. Despite these efforts only 90% of provider usage was obtained as some providers were not met directly due to scheduling conflicts. Future implementation efforts will require additional provider education, reminders, and monitoring to achieve 100% provider usage with new providers and student interns.

Post- Implementation Phase

Data analysis was conducted following the completion of the implementation phase and retrospective chart review on March 24, 2022. Clinical site's baseline data was obtained through the retrospective chart review and was compared to data collected during the implementation phase. Both periods of time included 12-weeks of data collection through patient paper charts and PHQ-9 questionnaires. Results were disseminated to DNP project committee members, key stakeholders, and clinical staff members following data analysis.

Process Comparison

The main goal of this project was to integrate a depression screening tool and follow-up care into the current clinical setting, utilizing Havelock's Theory of change as the guiding force. There was no current standardized depression screening tool in use prior to implementation of this DNP project. In the beginning, the location of survey completion was viewed as the most difficult challenge to overcome in the implementation process. Having never implemented survey materials to this patient population prior to this study, the clinical staff were unsure of the best approach to employ, which would result in favorable outcomes for both patients and staff. Overcoming time constraints, educational responsibilities, and adherence of staff and patient concerns led to the final approach, in which survey completion was conducted during the triage process by nursing students reading the survey question by question aloud. This approach increased physician time optimization effectively with each patient as well as enhanced survey completion rates, depression education, and student learning opportunities. While this planned process flow chart worked well during the designated period, it would not be feasible unless nursing students were present, as additional changes to staff responsibilities would be required resulting in further staffing shortages. See Appendix B flowcharts.

Project Timeline

Due to unforeseen obstacles, the actual project timeline deviated from the initial, projected timeline. My implementation start date was originally scheduled for October 2021 to March 2021; however it was pushed forward to January 3, 2022 owing to IRB delays, clinic holiday hours, winter weather delays, and COVID quarantine. Between January 3, 2022, and February 28, 2022, data was collected directly from the patient's medical chart. Due to the unavailability of an electronic medical records (EMR) system at this facility, data gathering took longer than intended, resulting in extra time with hand-compiled data retrieval. In addition to the chart reviews, data from the PHQ-9 questionnaire was collected from January 3, 2022 to March 24, 2022. The data was analyzed between March 25, 2022 to April 11, 2022, and then shared to the University of Arkansas Eleanor Mann School of Nursing doctorate committee on April 19, 2022, and subsequently to the clinical site. See Appendix G for the Gantt chart.

Evaluation of Results

Data Maintenance and Security

A spreadsheet utilizing Microsoft Excel was created and utilized for all data collection. Collection of data for all subjects during the retrospective chart review and implementation phase of this DNP QI project included age, sex, race, employment status, education level, marital status, PHQ-9 scores, medication provided, follow-up care, and referral information, which began January 3, 2022, and ended February 28, 2022. Multiple attempts were made to collect every paper chart during the retrospective chart review period, but despite best efforts, missing data in the form of misfiled charts and incomplete demographic data collection was encountered. See Appendix J. Patient identifiers were omitted for patient privacy and confidentiality. Patient data collection sheets were password protected on my personal laptop, which is also password

protected. I had the only access to secured patient data for the QI project that had been collected. Data was stored on a secured USB storage drive for accessibility and transferability to and from the clinic site. All data was destroyed after statistical analysis reporting was completed.

Data Analysis

Descriptive statistical methods were utilized to summarize data results of the DNP project. The descriptive statistics determined the statistical relationships between the outcome measures, process measures, and balance measures of the sample in this DNP project. A three-month retrospective chart review and data collection through the implementation phase were analyzed using the Statistical Package for the Social Sciences (SPSS) software. Demographic data sets to assess gender, race, utilization of pharmacotherapy, cognitive therapy, follow up care visits, educational levels, employment status, and referrals were analyzed utilizing frequencies. To determine depression rates, an independent samples t-test sometimes called a two-sample t-test was used. Additional pre- and post-implementation data comparisons were made to see how the PHQ-9 questionnaire affected depression rates, depression management, and referrals within the clinic. When two sets of non-count data were gathered, such as in this DNP project with retrospective chart review data and data collected after the PHQ-9 deployment, the two-sample t-test is used (Rietveld & van Hout, 2017).

During the retrospective chart review, 727 paper charts (N=727) were examined, spanning the period from October 1, 2021, to December 30, 2021. During the 12-week data collection period, an average of 60 patient visits were conducted per week. The patients' ages range from 18 to 89. There were 337 males (46.42%) and 389 females (53.58%) in the retrospective chart review of which 320 were white, 29 were black, 2 were Asian, 3 were Pacific Islander, 14 were Indian, and 359 were Hispanic. The employment statuses of the 727 patient

charts analyzed were as follows: unemployed (35.12%), retired (1.93%), student (4.82%), and employed (57.99%) as shown in Table 1.

Table 1

Demographic Data Retrospective Chart Review (N=727)

Demographic Data for Retrospective Chart Review *(N=727)*		
Age	Frequency	Percentage
18-29	163	22.42
30-49	312	42.92
50-69	239	32.87
70-89	13	1.79
Race		
White	320	44.02
Black or African American	29	3.99
Asian	2	0.28
Pacific Islander/Hawaii	3	0.41
Native American	14	1.93
Other	359	49.38
Ethnicity		
Hispanic	359	49.38
Non-Hispanic	368	50.62
Gender		
Male	337	46.42
Female	389	53.58
Highest level of education		
Middle School	97	13.34
High School	551	75.79
Some College	32	4.40
College degree	47	6.46
Employment Status		
Employed	421	57.99
Unemployed	255	35.12
Student	35	4.82
Retired	14	1.93
Disabled	1	0.14

During the post-implementation phase, 529 patients (N=529) completed the PHQ-9 survey, which spanned from January 3, 2022, to March 24, 2022. During the 12-week data collection period, an average of 60 patient visits were conducted per week. Patients ranged in age from 18 to 69 years old, with 207 male patients (39.13%) and 322 female patients (60.87%). The race and ethnicity of the post- implementation sample population included 231 Caucasians, 33 African American, 18 Asian, 1 Pacific Islander, 1 Native Indian, and 245 Hispanic, which is consistent with pre implementation data. The employment statuses of the 529 patient charts analyzed were as follows: unemployed (97.73%), retired (0.95%), student (1.52%), and employed (60.49%) shown in Table 2.

Table 2

Demographic Data Post- Implementation (N=529)

Demographic Data Post- Implementation *(N=529)*		
Age	Frequency	Percentage
18-29	59	11.15
30-49	301	56.90
50-69	169	31.95
70-89	0	0
Race		
White	231	43.67
Black or African American	33	6.24
Asian	18	3.40
Pacific Islander/Hawaii	1	0.19
Native American	1	0.19
Other	245	46.31
Ethnicity		
Hispanic	245	46.31
Non-Hispanic	284	53.69
Gender		
Male	207	39.13
Female	322	60.87
Highest level of education		
Middle School	163	30.81
High School	234	44.23
Some College	86	16.26
College degree	46	8.70
Employment Status		
Employed	320	60.49
Unemployed	196	37.05
Student	8	1.52
Retired	5	0.95
Disabled	0	0

Outcome Measures

The objectives of this DNP project were to evaluate how the implementation of the depression protocol, following a positive PHQ-9 screening, affects access to depression

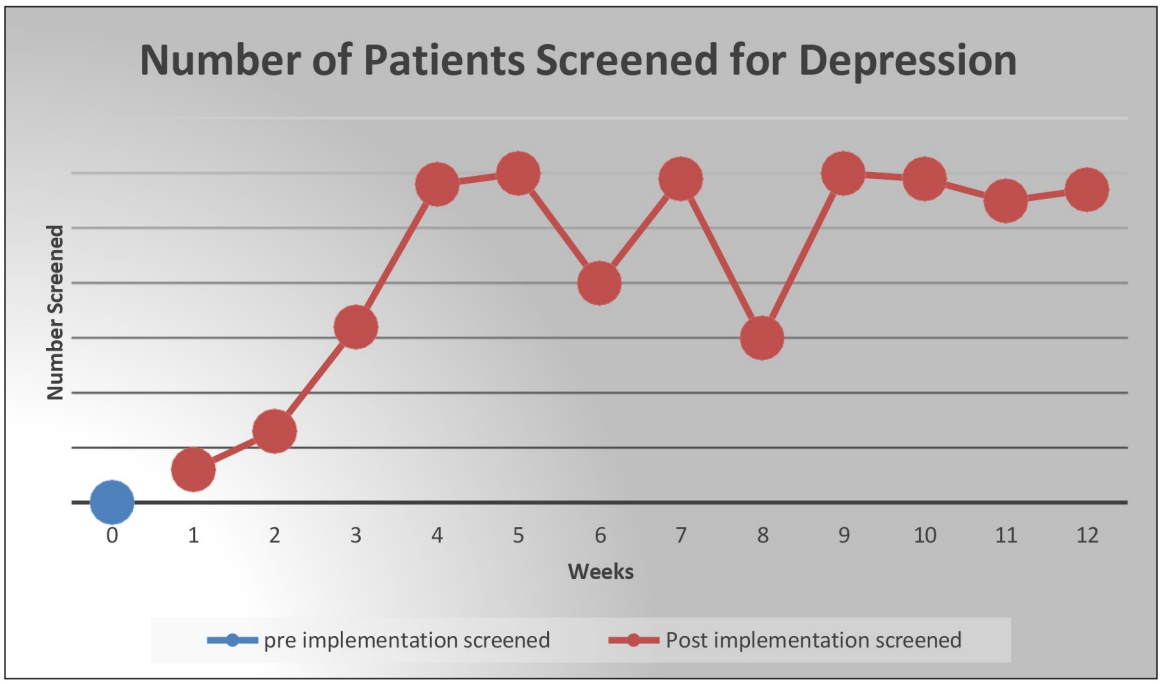
recognition and services provided. The specific aim was to increase the percentage of depression screenings from 5% to 50% by March 2022 (Maurer et al., 2018). Utilization of a run chart depicted the process measures observed. Consistent with the site's objectives, the evaluation plan sought to improve depression recognition thereby improving patient outcomes and access to depression care. The key driving factor in this project implementation was to increase access to depression services while reducing the cost burden associated with undiagnosed and undertreated depression. A comparison of pre-implementation data to post-implementation data was performed to determine the impact of this DNP project. Four outcome measures identified during the planning stages of this DNP project included the total number of patients newly diagnosed with depression, the total number of patients diagnosed with depression, patients screened for depression, and the number of patients receiving depression evaluation.

Outcome Measure #1 Patients Screened for Depression. The first outcome of this DNP project was to increase the total number of patients who were evaluated for depression using the PHQ-9 depression screening tool. Prior to implementation, the facility's depression diagnosis was based on patient communication and provider judgment as no formal depression protocol was in place for diagnosing and treating depression symptoms. Similarly, due to the paper medical record system still in use at the selected facility, no statistical demographic or depression diagnosis data was readily available for analysis. During the pre-implementation phase, no patients with an established depression diagnosis were screened using a depression screening instrument, according to data. Within four weeks of implementation execution, data showed a jump from six patients screened the first week to 58 individuals screened using the PHQ-9 questionnaire. As the implementation phase advanced, temporary personnel, volunteer staff changes, staff understanding, and patient adherence difficulties were addressed, resulting in

improved patient responses to the screening processes. Staff assisting patients in completing the PHQ-9 versus enabling patients to take the questionnaire on their own could have resulted in skewed results. While this strategy enhanced questionnaire completion, it may have introduced bias, resulting in abnormally high or low depression rates. Figure 1 illustrates pre-and post-implementation numbers of patients screened for depression.

Figure 1

Number of Patients Screened for Depression

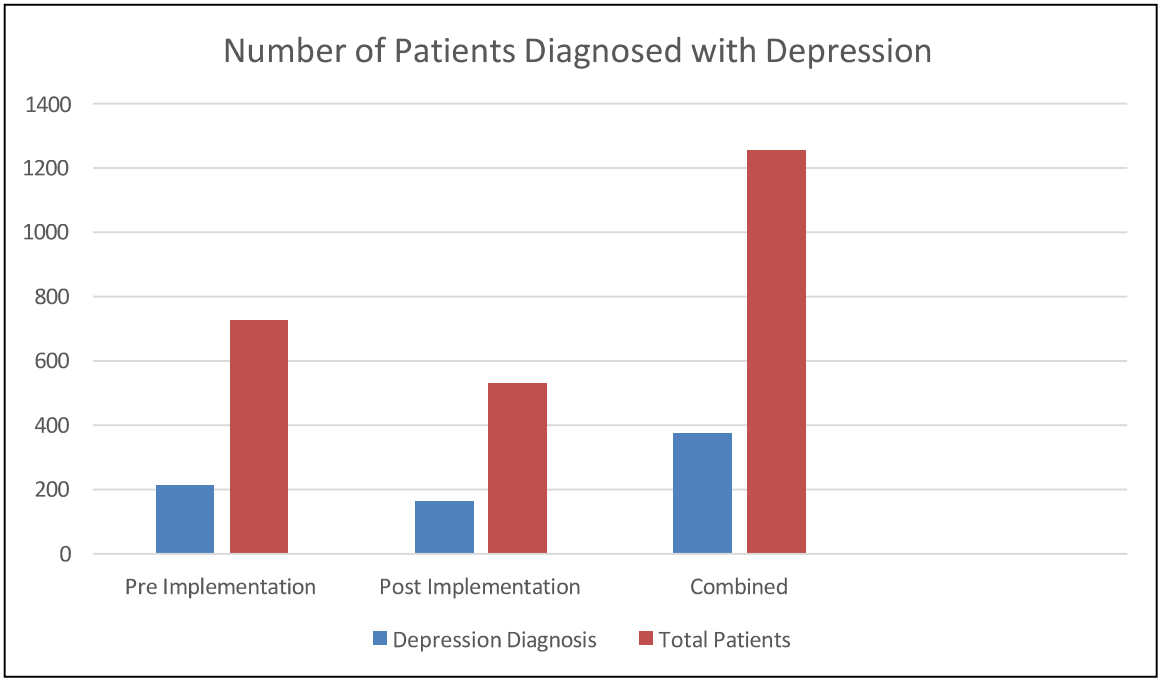


Outcome Measure #2: Patients Diagnosed with Depression. The second outcome measure was to compare the total number of patients diagnosed with depression utilizing data from the pre- implementation phase to the post- implementation phase. Pre implementation data collection efforts estimated that 29.07% (N=212) of the patient population had a diagnosis of depression. When compared to pre-implementation data, post-implementation data showed that

31.00% (N=164) of the patient population was depressed, a rise of 1.93%. as depicted in Figure 2.

Figure 2

Number of Patients Diagnosed with Depression



Further analysis with the retrospective data used as pre-implementation scores, and concurrent data used as post-implementation scores. There were 729 retrospective charts reviewed for depression diagnosis in the pre-implementation phase (M = 1.03, SD = 0.161), compared to 529 concurrent chart reviews in the post-implementation period (M = 1.31, SD = 0.463) which demonstrated a statistically significant increase, 0.28, in depression diagnosis, $t(528) = 13.070$, $p < .000$ after implementing PHQ-9 screening as shown in Table 3. Diagnosis rates increased by 1.93% from pre- implementation data. In addition to improved identification rates depression management services provided also had a perceived increase in usage from pre-

to post- implementation data; pharmaceutical (45.57%), cognitive therapy (22.01%), referrals to mental health specialists (10.06%), and depression education (100%) as compared to pre-implementation data.

Table 3

Pre- and Post- Implementation Depression Diagnosis t-test

	N	***Mean***	***SD***	***df***	***t***	***p-value***
PRE	*727*	*1.03*	*0.161*	*528*	*13.070*	*0.000*
POST	*529*	*1.31*	*0.463*			

The moderate score categories on the PHQ-9 questionnaire identified individuals at risk for developing depression in the post-implementation phase, in addition to identifying depression.

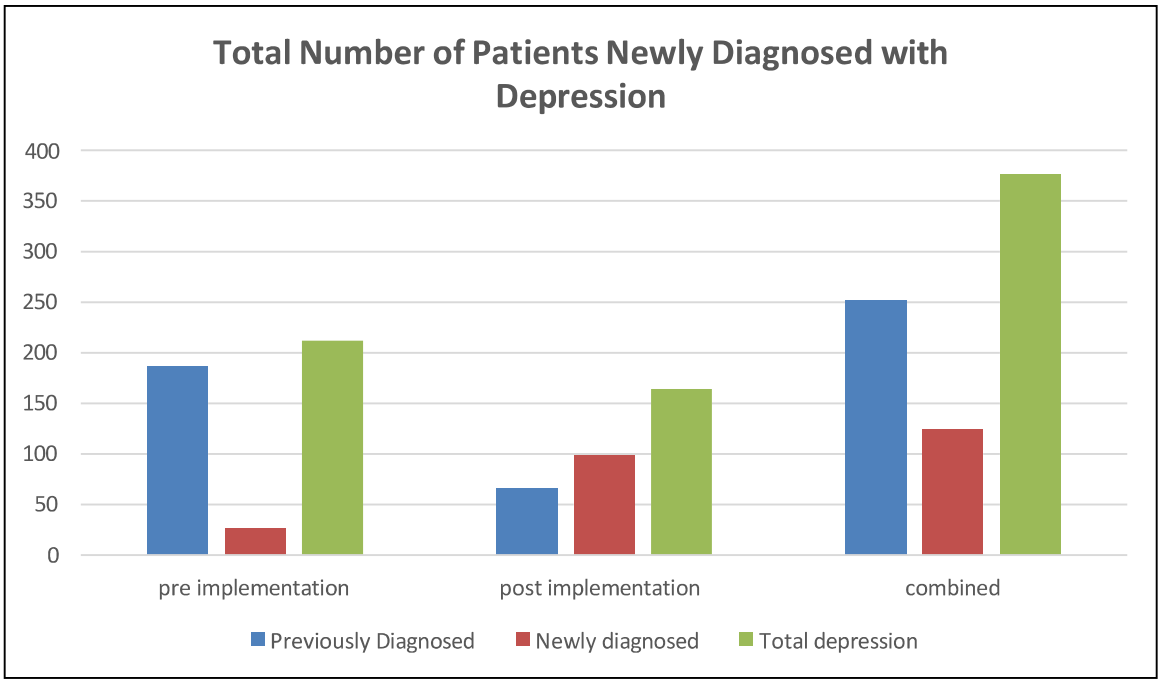
As a result of this post-implementation data, 106 patients were recognized as needing additional depression examinations with future appointments, which was not achievable with pre-implementation data. Even though both phases collected data over a 12-week period, variances in staff, COVID surges, holiday hours, and weather could have skewed data collection and appointment scheduling attempts.

Outcome Measure #3: Patients Newly Diagnosed with Depression. The third outcome measure was the total number of patients who were newly diagnosed with depression during the pre-implementation and compared to the post-implementation phase. During the pre-implementation phase, patients were only deemed newly diagnosed with depression if the diagnosis was made between October 1, 2021, and December 21, 2021. During this phase, 26 of the 212 patients with depression who were identified met the criteria for being newly diagnosed. The patients were required to have a positive PHQ-9 screening, a positive provider evaluation,

and no history of depression on file in the post-implementation period. Out of the 164 individuals diagnosed with depression, 98 new patients were diagnosed with depression using this screening method. Pre- and post- implementation data revealed a 47.5% rise in depression diagnoses as illustrated in Figure 3.

Figure 3

Number of Patients Newly Diagnosed with Depression

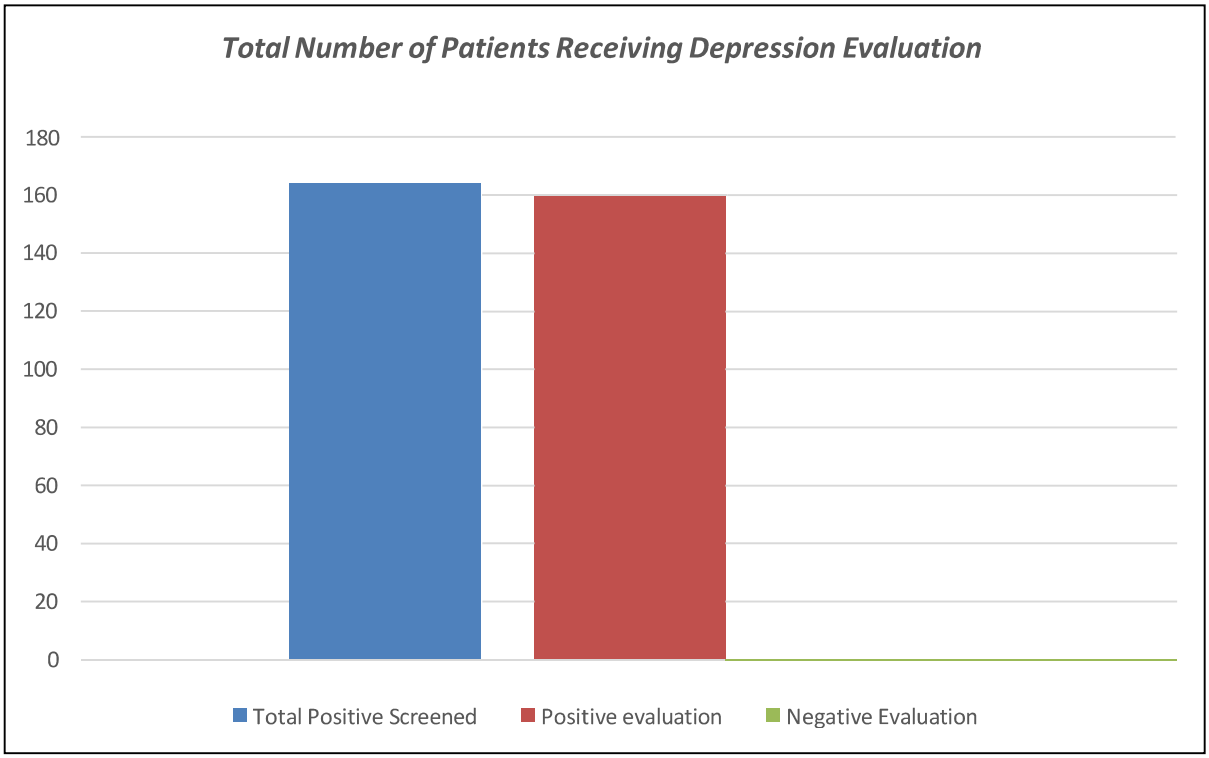


Outcome Measure #4: Patients Receiving Depression Evaluation. In the post-implementation phase alone, the fourth outcome measure was to compare the total number of patients who screened positive, PHQ-9 score 10 or higher, to the physicians' positive and negative evaluations. While the PHQ-9 depression screen can be a useful tool for quickly screening many patients, if no provider judgment is used, it might result in undesired false positive rates. To determine the feasibility of this DNP project, an analysis of false positive rates

was required. During the 12-week post implementation period, 529 patients were screened using the PHQ-9 questionnaire. One hundred and sixty-four patients out of 529 met the criteria for a provider evaluation by scoring a 10 or higher on the questionnaire. Of the 164 patients that were screened, 159 were true positives, meaning their depression diagnosis was verified by provider evaluation, and 5 were false positives, meaning the provider did not confirm their depression diagnosis during the assessment. When compared to the provider assessment, the PHQ-9 questionnaire had a sensitivity of 96.95% and a specificity of 3.05%. Figure 4 illustrates the distribution of patients receiving depression evaluations.

Figure 4

Number of Patients Receiving Depression Evaluation



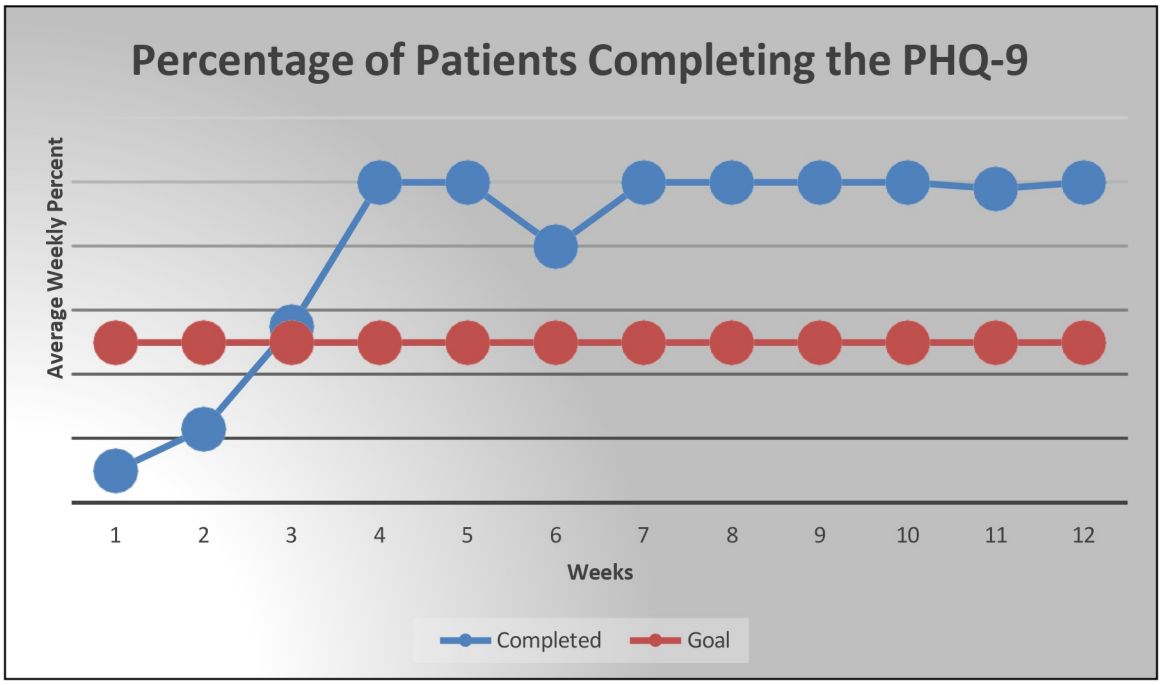
Process Measures

The process measure of this DNP project was used to address the effectiveness of implemented changes at the clinical site. During the implementation phase adjustments were made according to observation trends utilizing the Plan-Do-Study-Act cycles (Melnyk & Fineout-Overhold, 2015). Compliance and process observations were monitored bi-weekly by me through virtual staff meetings and data collections. During the implementation phase, identified process flow barriers and the numerous solutions employed to improve the project outcomes are broken down into weekly PDSA cycles. See Appendix Q for weekly PDSA cycles and Appendix P for Implementation iterations over time.

The percentage of patients who completed the PHQ-9 questionnaire was one process measure analyzed for this DNP project. Because just 5% of facilities polled reported using a standardized screening instrument for depression screenings, benchmark percentages for depression screenings utilizing a standardized screening test for primary care physicians in the United States was unknown (Maurer et al., 2018). As a result, the target of this DNP project process measure was to increase screening rates at this clinical site from 5% to 50% or more by completion. B Run charts are frequently used to illustrate data over time and to provide a fast overview of performance measures (IHI, 2021). By week 3 of the implementation phase, the 50% screening rate had been achieved, and it had been surpassed in the following weeks as seen in Figure 5.

Figure 5

Percentage of Patients Completing the PHQ-9 Questionnaire



Balancing Measures

Balance measurements were used to assess both positive and negative unintended outcomes of the DNP project deployment. The percentage of patients receiving pharmaceuticals, cognitive therapies, referral to mental health professionals, and depression education were all used as balance measures for the DNP project. To further understand the impact of this DNP project on depression management, these measures were studied using pre- and post-implementation data sets.

Balancing Measure# 1: Patients Scheduling Follow-up Appointments. The first balancing measure identified was to monitor the scheduling of follow-up appointments. Patients were asked to schedule follow-up appointments 99% of the time when they checked out, but only 93% of them did, which was similar with pre-implementation data. Patients' reasons for not scheduling follow-up appointments were divided into three categories: scheduling issues,

transportation, and financial hardships. Unfortunately, because most visits were planned three months in advance, measuring appointment compliance was impossible owing to the DNP project's 12-week implementation phase.

Balancing Measure #2: Patients Receiving Medication. The percentage of patients receiving medication as a type of treatment for their depression symptoms was the second balancing measure identified. Pre-implementation data revealed that 47.51% of patients were being treated for depression symptoms with medication. Whereas, according to post-implementation data, 93.08% of individuals diagnosed with depression received some type of pharmaceutical treatment for their depression. By the end of this DNP project, a 45.57% increase in pharmacological management for depression diagnosis had been obtained.

Balancing Measure #3: Patients Receiving Cognitive Therapy. The third balancing measure identified was the percentage of patients receiving cognitive therapy. Only 2.14% of patients were using cognitive therapy as a source of depression treatment prior to implementation, but post-implementation data indicated a 19.87% increase in this therapy technique, with 22.01% of patients using cognitive therapy for depression management. This rise could be ascribed to the DNP project's depression decision tree, which has resulted in a more uniform approach to depression treatment alternatives.

Balancing Measure #4: Patients Referred to Mental Health Specialist. The percentage of patients who received a mental health referral due to the severity of their depressive symptoms was the fourth balancing measure identified. According to pre-implementation data, 2.61% of depression diagnosed patients were sent for extra help beyond what this facility could provide. According to post-implementation data, 10.06% of diagnosed patients were referred to a mental health professional or a crisis center due to the severity of their

presenting symptoms. The categorical data provided by the PHQ-9 assessment sheet made severity of symptoms easier to visualize.

Balancing Measure #5 Patients Receiving Depression Education. The fifth balancing measure identified was the percentage of patients receiving depression education. Pre-implementation data revealed that education was supplied or given in relation to depression management in 47.74% of patients' medical chart. As a means of presenting the PHQ-9 questionnaire, post-implementation data gave education about depression to 100% of the patient population. Additionally, patients who were later confirmed to have a positive depression diagnosis received extra teaching materials, which were appropriately noted in each patient's medical chart.

Discussion

The aim of this DNP QI project was to introduce the use of a depression screening tool to aid in the identification of depression and to expand the provisions of depression services. The goal of this project was to increase the percentage of patients screened for depression using the PHQ-9 questionnaire in a rural primary care setting to improve depression management. The screening rate for depression using the PHQ-9 questionnaire increased significantly during the project's implementation phase. Furthermore, staff members were pleased about using the depressive decision tree created specifically for this project as it provided continuity of care.

Depression diagnosis and treatment in the rural primary care setting remains difficult for healthcare professionals and personnel due to the ambiguous nature of the presentation. When used correctly, a depression screening tool provides diagnostic information that can be used to improve services rendered. The PHQ-9 questionnaire enhanced provider satisfaction and patient outcomes by allowing doctors to swiftly identify patients' indications and symptoms of

depression. Increased frequency of monitoring, treatment, or referral options based on need resulted from improved patient outcomes in the form of quick diagnosis. The standardization of this methodology resulted in increased provider satisfaction in the form of higher diagnostic rates and continuity of care.

Havelock's theory of change served as the driving force behind this QI study, providing the basis for deploying the depression screening tool and decision tree in a rural primary care clinic. Havelock's theory of change, which consisted of six processes, emphasized creating relationships, identifying the problem, gathering resources, selecting a solution, gaining acceptance, and long-term sustainability. I was the change agent for this QI project, providing on-site and on-call consultations as needed. To foster relationships between the staff and myself, team meetings and educational sessions were conducted. Internal and externa contributing variables like bias, stigma, perceived lack of competence, and language challenges were all evaluated and discussed during these team meetings. Several PDSA cycles were completed to increase the completion rates of the PHQ-9 questionnaire.

Several PDSA cycles were completed with the goal of boosting the completion rate of the PHQ-9 questionnaire as well as the utilization of the provider assisted decision tree for depression management. Current results, pre- implementation, indicate the clinic had a depression rate of 29.07% relying solely on patient self-observation of symptoms and provider judgement. Post- implementation depression rates of 31.00% include depression marked by a positive PHQ-9, score 10 or above, and provider evaluations. By removing previously diagnosed patients from the positive PHQ-9 scores a result of 12% is obtained. This shows that approximately 12% of patients are going undiagnosed by not utilizing the PHQ-9 screening tool. Results from other depression studies regarding the use of PHQ-9 surveys have resulted in a

variety of results from 3.9% to 15.0% with a 95% CI (Adewuya et al., 2022; Cao et al., 2020; Fekadu et al., 2022). Thus, making my results within range of what other depression studies have found with greater sample sizes. The significant standard deviation in study outcomes were attributed to the substantial variability between studies. The sample size, location, screening instrument employed, instrument administration, patient population, and study length were just a few of the factors that had a substantial impact on the study's results.

In terms of improving percentages of patients screened with a depression screening tool my goal of 50% set by industry standard has been surpassed as I currently have a screening rate of 98% of patients entering the clinic provided with and completing a PHQ-9 questionnaire (Maurer et al., 2018). This is an above average finding for most primary care facilities but not an abnormal finding for current and evolving research specific studies in which 80% or greater return has been achieved (Blenkiron & Goldsmith, 2019).

Economic and Cost Benefits

The economic benefit of implementing a depression screening tool into the rural primary care setting could be very lucrative for the clinical site and patient population. As this primary care clinic provides care to low-income patients regardless of their ability to pay the cost benefits of increasing depression recognition did not increase their profitability directly as this clinic relies heavily on private donors for support. Instead increasing depression recognition can boost the patients' outcomes, decrease the patients' out of pocket expenses for specialists, and improve the patient's overall wellbeing. Which in turn helps patients be more productive in their daily lives, improves work force, reduces emergency and acute care episodes, and improves the community's depression financial burdens.

Additionally, the cost benefit of this DNP project is cost efficiency, with most costs incurred with the reproduction of a free online survey. To avoid the increased expense in supplies the clinic could set up a computer station allowing patients to input their information digitally, reducing paper and printing costs. The information could then be digitally captured and transmitted to facilities as needed. However, the clinical site operates with a paper medical charting system, updating to an EMR system is a huge undertaking requiring additional financial support that is currently unavailable.

Healthcare Quality Impact

The implementation of a depression screening tool into the rural primary care setting is based on current evidence-based practice recommendations from CMS and USPSTF (Sinischalchi et al., 2020). Current research shows that routine depression screenings lead to improved patient outcomes, improved quality of care, and decreased cost burdens associated with the mental health disorder (Keeley et al., 2016; Fleury et al., 2019). Improving depression screening at the clinical site has the potential to further improve patient outcomes, improve services rendered, decrease acute episodes, and improve financial stability with increased utilization. Current project research provided improved depression diagnosis and follow-up management in addition to improved communication and team dynamics among staff within 3 months of use.

Limitations

During the implementation phase of this DNP QI project, a few limitations were discovered. The most significant limitation was the growing use of volunteer workers, physician rotations, and students. The use of volunteer staff provided the clinic with the flexibility to see additional patients at lower cost. However, this resulted in further challenges with continuity of

care, particularly with this QI project and the usage of the depression screening tool and depression decision tree. Throughout the 12-week implementation phase, variances in provider treatments, bias, and education levels were regularly addressed to eliminate as many variables as feasible.

The length of the implementation phase was also an obstacle. The DNP project was unable to track the patients' progress from diagnosis to first follow-up session since most reevaluations for depressive symptoms and the effectiveness of the therapy prescribed were scheduled at least 3 months in advance. As a result, appointment adherence, management, and post-diagnosis depression symptoms could not be tracked. These findings could have demonstrated that the depression screening tool is effective for more than just the detection of depression symptoms. A depression screening can be used for monitoring both the psychological and somatic symptoms of depression. Routine screenings improve communication between physicians and patients by normalizing depression in everyday conversation. As a result, bias and stigma, which often prevent people from self-reporting, were reduced.

During the implementation phase of the DNP project, a maximum of 1,500 participants were expected; however, delays in implementation, severe weather, holiday schedules, and an increase in COVID restrictions from the CDC resulted in a reduction in the expected sample size. This smaller sample size can result in erroneous or exaggerated standard deviations within participant groups, resulting in bias or mistakes (Rietveld & van Hout, 2017). As a result, the outcomes depicted in this DNP study were those that would only occur during pandemic times but not during non-pandemic times and were not representative of the entire population sampled on a regular basis.

The data collection methods used in this DNP project was also seen as a potential

limitation. Patients were initially encouraged to complete the questionnaire on their own initiative, however this strategy provided low response rates. As a result, student nurses completed the questionnaire verbally with each patient in their chosen language, either Spanish or English. Leading to all subsequent questionnaires completed in their entirety. Thus, this DNP project deployed two survey completion procedures which could have created skewed data findings that will need to be further investigated. More research into survey completion rates and presentation formats is required.

Sustainability

The sustainability of any project requires stakeholder and administrative support for success. The positive impact of depression awareness, improved patient outcomes, and management services on the community in which the clinic is located has created the necessary vested interest for long-term sustainability. As a result, the goal for long-term viability is to present all project outcomes and make recommendations for the facility's future growth and advancement of the depression management protocol. Following the DNP implementation period, the facility intends to keep the depression screening protocol as the new standard of care for their patient population, thus, completing Havelock's theory of change. As a result of these policy modifications, the depression screening processes implemented during this DNP project require minimum oversight and upkeep.

Recommendations

Practice Implications

I would recommend the clinical site to keep using the depression screening instrument and depression decision tree because it has shown to improve depression decision skills, education, and management of depression symptoms, and bias identification. Future efforts to

address the massive influx of new volunteer staff, depressive prejudice, and education gaps in depression management continue to be critical determinants in project success or failure. To address these concerns, the clinic has included a depression screening protocol in its new staff orientation packet, which is sent to all physicians, students, and volunteers who interact with patients. Future research into the long-term use of a depression screening instrument should be reviewed to capture follow-up care and maintenance activities after the initial depression diagnosis.

Policy Implications

There were no facility-wide policies or procedures in place for depression screening and management prior to this project. Until now, the gold standard approach for diagnosis has been provider judgement and patient self-reported symptoms. Although U.S. guidelines state that every adult should be checked for depression, there is no mention of selectivity in the use of a depression tool or measure in the guidelines (Sinischalchi et al., 2020). Following the implementation and evaluation of the DNP QI, site polices were being revised to improve depression diagnosis and care at the clinic. The implementation of these depression screening policies in various health-care settings would improve the recognition and management of depression in all patients outside of the mental health specialist's office.

Dissemination

Site and DNP committee Reporting

Project outcomes will be disseminated via a virtual poster presentation at the DNP Intensives on April 19,2022. Following the University of Arkansas DNP intensive presentation, project outcomes will be presented to staff, providers, and key stakeholders via a PowerPoint

poster presentation as all members had a personal stake in the successes and failures of this DNP project.

Professional Reporting

Submissions to the *American Journal of Psychiatry,* the *Clinical Psychology Review,* the *Annual Review of Clinical Psychology,* and any nursing conference interested in depression screening and management are among the possibilities for publication of this DNP project. These journals were chosen because they had previously published articles on related issues.

Conclusion

Depression remains to be a highly missed opportunity among the medical profession due to high rates of misdiagnosis, mismanagement, and high-cost burdens globally. Despite depression screening guidelines established in 2016 by USPSTF recognition of depression in primary care through the utilization of a depression screening tool remains low to non-existent (Sinischalchi et al., 2020). Evidence supports implementation of a depression screen tool such as PHQ-9 in the rural primary care setting to improve depression recognition, patient outcomes, and cost burdens associated with a depression diagnosis. This DNP project aspired to provide further evidence to support depression screenings utilizing the PHQ-9 questionnaire in the rural primary care setting to improve recognition of depression.

There were 729 retrospective charts reviewed for depression diagnosis in the pre-implementation phase compared to 529 concurrent chart reviews in the post-implementation period. An independent samples t-test was statistically significant $t(528) = 13.070$, $p < .000$ which demonstrated a statistically significant increase in depression diagnosis after implementing PHQ-9 screening. Long-term sustainability will depend on continued depression screening and follow-up care for persons screened and those diagnosed with depression. The

only measure that did not have an increase was patient scheduled follow-up appointments. Appointment scheduling remained the same despite the use of a depression screening tool. Research on this topic is needed to further depression care among the economically disadvantaged populations which have been shown to have increased burdens related to depression care, symptoms, and financial costs. Further research should include evaluation of the patients' depression biases, patients' satisfaction, and provider biases towards implementation of depression screenings.

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Appendices

Appendix A: Global Aim Statement

Write a Theme for Improvement: Increasing Depression awareness by establishing depression screen, management guidelines and referral protocol.

Global Aim Statement

Create an aim statement that will help keep your focus clear and your work productive:

We aim to improve: Identification of depression in at-risk patients through depression screening, medication management utilizing evidence based protocols and utilizing referral networks.

(Name the process)

In: Primary care clinic of Fort Smith, Arkansas

(Clinical location in which process is embedded)

The process begins with: Screening of all patients with PHQ-9 who are scheduled in the clinic no matter their chief complaint.

(Name where the process begins)

The process ends with: Diagnosis of depression resulting in medication management or referral to mental health provider for more advanced/crisis conditions.

(Name the ending point of the process)

By working on the process, we expect: an increase in number of depression diagnosis, increase in depression medication management, increase in patient and provider education on depression, and increase referrals and referral network.

(List benefits)

It is important to work on this now because: improving depression awareness will increase access to care, treatment options, improve patient health outcomes, decrease spending on unnecessary treatments, increase patient satisfaction, increase depression management, and increase depression education

(List imperatives)

Create Flowchart

Specific Aim Statement

We will: increase

The: percentage of patients completing a depression screening

(process)

From: current physician patient encounters screening est. of less than 5% (Douglas et al., 2018)

(Baseline state/number/amount/percentage)

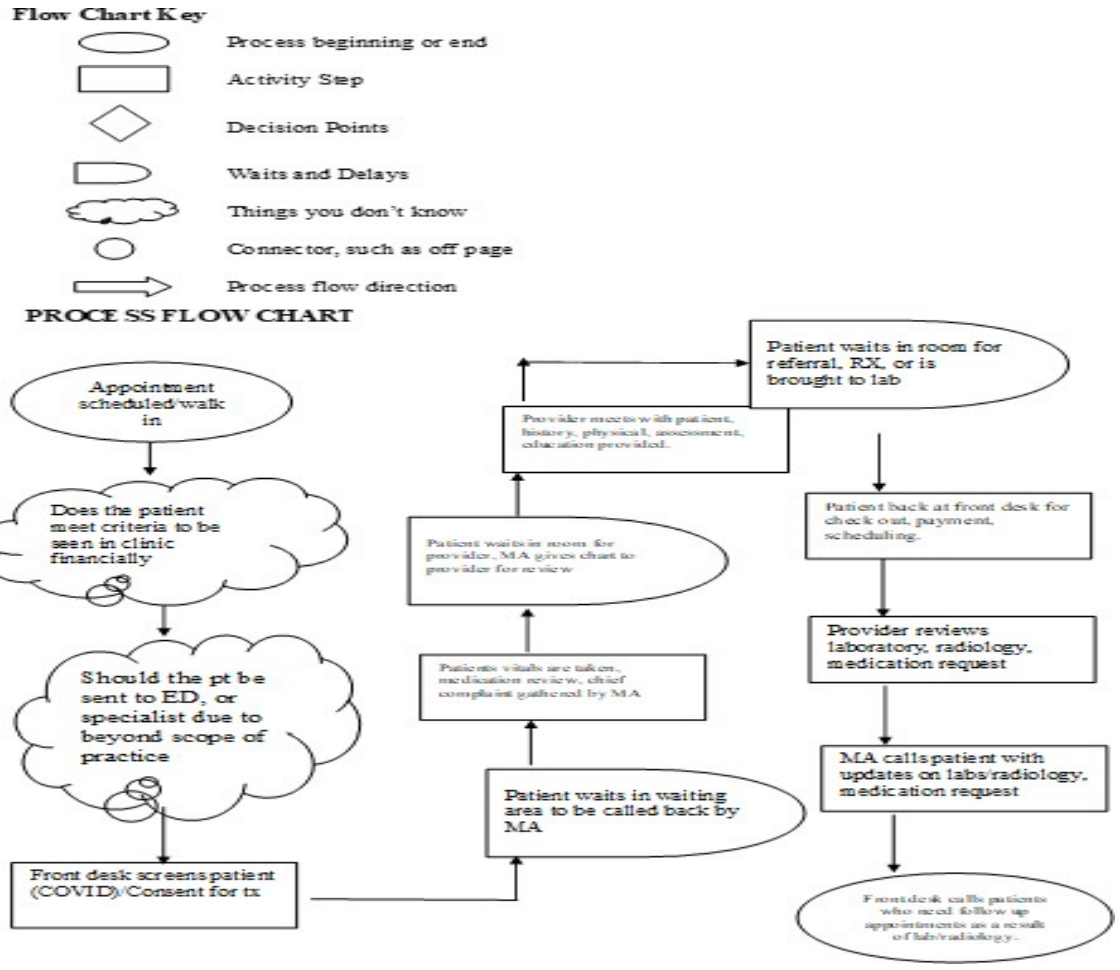
To/By: 50%

(Describe the change in quality or state the number/amount/percentage)

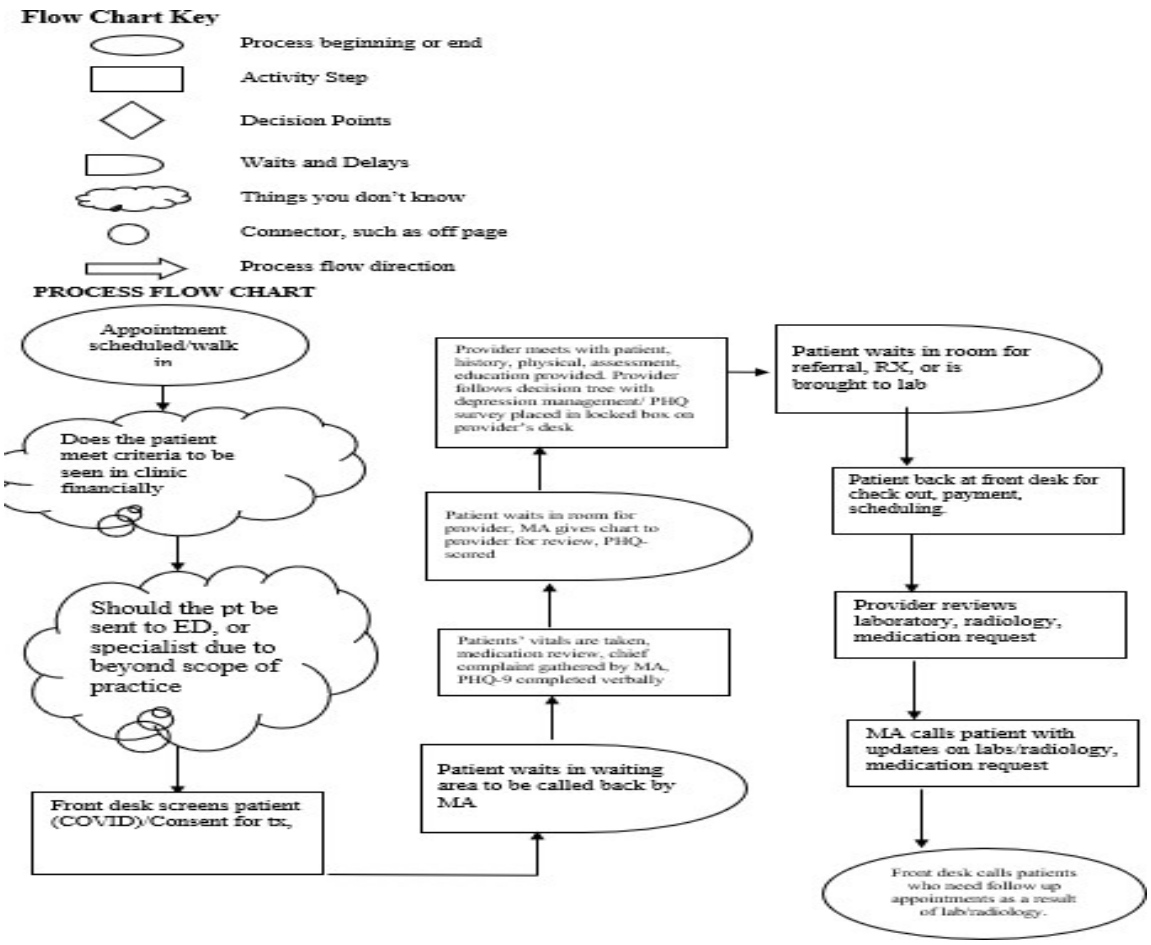
By: March 2022

(date)

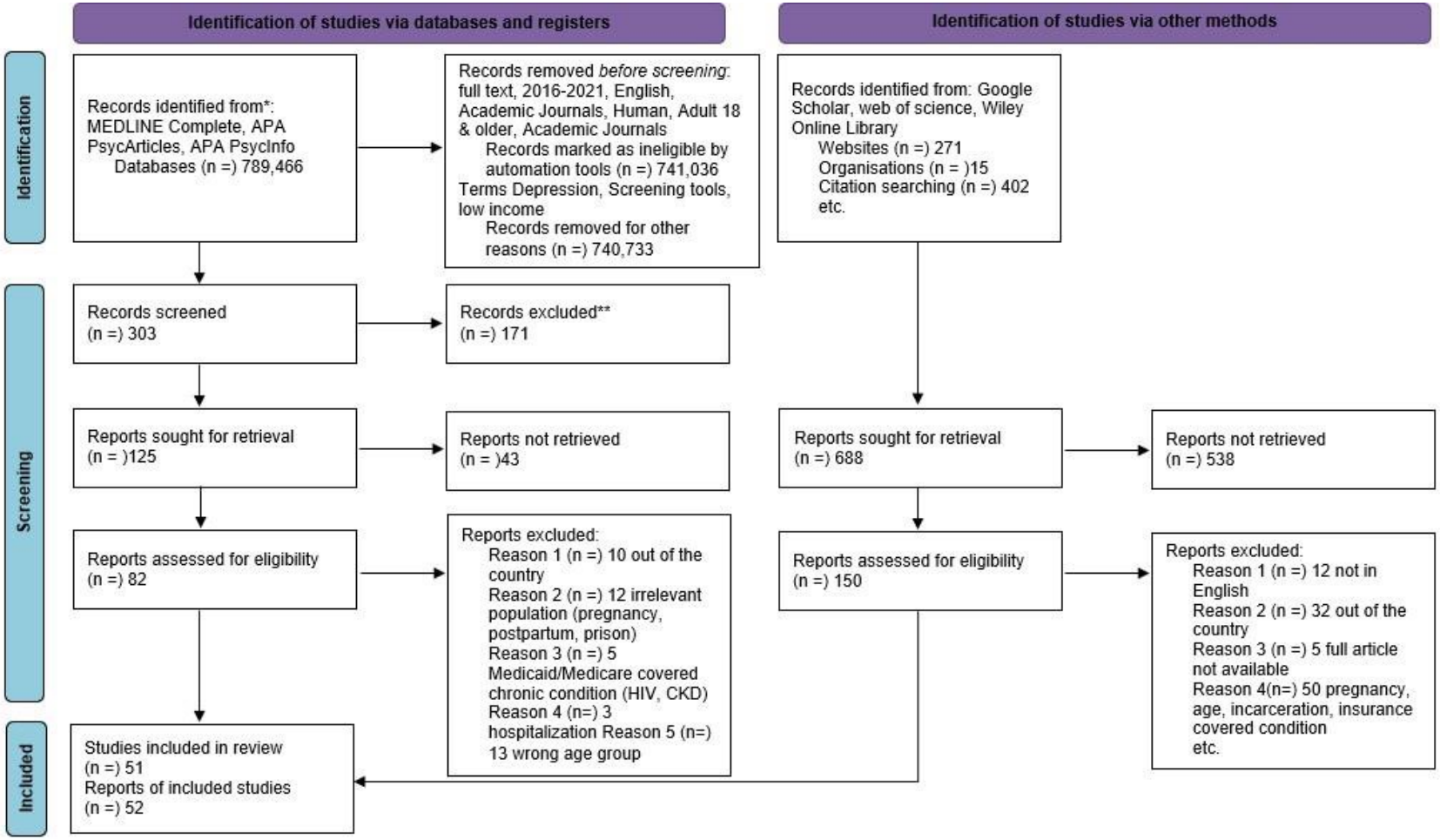
Appendix B: Pre-Implementation Process Flowchart



Appendix B: Post-Implementation Process Flowchart



Appendix C: PRISMA 2020 Flowchart



*Consider, if feasible to do so, reporting the number of records identified from each database or register searched (rather than the total number across all databases/registers).
**If automation tools were used, indicate how many records were excluded by a human and how many were excluded by automation tools.

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71. For more information, visit: http://www.prisma-statement.org/

Appendix D: Evidence Table

Authors	YR	Country	Theory	Independent Variable(s)	Dependent Variable(s)	Research Design	(N=)	Data Collection	Results	Level of Evidence
Alang, S., & McAlpine, D	2020	U.S.	None Listed	Treatment modality (prescription, cognitive therapy, or combination). And Demographic data	Subjective assessments of depression treatment. (Perceived effectiveness of help)	Survey	N= 4,169	Information was collected from 2015-2016 National Survey on Drug Use and Health.	Perceived effectiveness of treatment reflects both patients reported experiences of care and patient reported outcomes of care thus understanding sociodemographic and health characteristics of patients is vital to the success of depression treatment	III
Bowen, D. et al	2020	U.S.	None Listed	Collaborative Care Management on depression outcomes	Native American/Alaska Native versus white populations depression response & remission rates	Observational study design Regression models stratified by the ethnic racial groups from 3 clinics	.N= 1,993	Pt took a pre PHQ-9 survey and then follow up survey was compared, process variables, demographic data collected. Provider survey	All ethnic groups benefited from the Collaborative care management implementation despite demographic differences. Primary care providers changes	IV

Breslow, A et al	2019	U.S.	None Listed	High expense of treating depression among adults in the USA	Interventions to decrease depression treatment expenditures	Systematic Review	N=20 articles	PubMed Search 1/1/16-4/26/19. Including abstracts containing depression or depressive disorders, expenditure, expense, or payment. Limited to peer-reviewed journal articles published in English adults (18yrs old or older), in the USA yielding 245 studies. 2 authors reviewed 245 articles for inclusion excluding 219 for not being about depression, sample not drawn from USA, not about health care expenditures, not empirical, not adult human focused. The remaining 26	Substantial increase in expenditure for payers and out of pocket expenses. Due primarily to prolonged treatment, frequent outpatient visits, increased post-acute care, and recurrent hospitalizations for preventable concerns due to noncompliance. Increased with comorbid illness treatments. Interventions showing promise to reduce expense include coordination of care, in home cognitive therapy, further systematic evaluations of disease modifying drugs to treat comorbid depression and medical symptoms.	I

								articles reviewed by 3 authors for depth excluded 6 for not about depression, not about health care expenditures, not adult human focused on eligibility		
Fambach, S. et al	2019	Australia	Grounded theory approaches	Validity, sensitivity, specificity, and acceptability of the culturally adapted 9 item patient health questionnaires (aPHQ-9)	PHC Staff perception	Survey	N=36	Staff nominated by participating services, getting survey adapted from PHQ-9 (aPHQ-9), MINI International Neuropsychiatric Interview	Culturally adapting the PHQ-9 appears to be acceptable and feasible to use	III
Fleury, M. et al	2019	Canada	Andersen Behavioral model	N/A	N/A	Systematic review/survey	N=372 patients d, N=328 participation.	Data collection January to June 2017. To interview pt during their ed visit. Pts had to have a MH diagnosis or referral. Questionnaires took approximately 40min to complete, covering sociodemograp	The pts perceived need is the primary reason for ED visit.	IV

								hic and socio-economic characteristics, health beliefs, self-assessed physical, MH conditions, utilization and satisfaction with ED and MH services.		
Frost, H. et al	2018	Scotland	None listed	N/A	N/A	Systemic Review	N= 5222, 104 reviews, 39 meta-analyses	A systematic review of reviews. Methods were pre-specified and documented in a protocol (PROSPERO–CRD42016049278). We systematically searched 7 electronic databases: CDSR; DARE; PROSPERO; MEDLINE; CINAHL; AMED and PsycINFO from 2000 to May 2018. Two reviewers applied pre-defined selection criteria,	Motivational interviewing can be beneficial but more specificity to health and social problems needs to be implemented. Training groups and code helps to ensure stainability and continuity of care	I

								extracted data using TIDIER guidelines and assessed methodological quality using the ROBIS tool. We used GRADE criteria to rate the strength of the evidence for reviews including meta-analyses.		
Garland, A.F. et al	2018	Ethiopia	None listed	WHO-5 versus PHQ-9	Depression diagnosis	Quantitative study	N=849	Participants completed the WHO-5 and PHQ-9 questionnaire	The WHO-5 was seen as favorable sore of depression screening due to the accessibility and usability of the screening which did not require increased mental health specialty training for interpretation as the PHQ-9 most often needs.	III
Huibers, J. et al	2007	Netherlands	None listed	Internet based cognitive behavioral therapy	Increase access and availability, reduce cost of depression treatment	Randomized Controlled trial	N= 3876	N=13384 abstracts retrieved, PubMed, embrace, psycinfo, Cochrane library from	Self-guided iCBT is effective in treating depressive symptoms. The use of meta-analyses of	I

								database from inception to 1/1/16. Measures: outcomes included the beck depression inventory, center for epidemiological studies depression scale, PHQ-9	individual participant data provides substantial evidence for clinical and policy decision making because self-guided iCBT can be considered as an evidence based first step approach in treating symptoms of depression.	
Karam, M. et al	2018	Belgium	Joanna Briggs Institute's Methodology for conducting synthesis	N/A	N/A	systematic review of qualitative research	N=16 articles	1st search MEDLINE to identify the text words used to address the concept of collaboration. (Inter, multi, professional, disciplinary, teams, agency, organizations, and collaboration, components, concepts, framework)2nd identified keywords and index terms Cochrane; JBI; CINAHL; Embase;	Similarities between conceptual framework of interprofessional and interorganizational collaboration includes communication, trust, respect, mutual acquaintanceship, power, shared goals, congruent philosophies and values, consensus, patient centeredness, task	I

								Medline Scopus; Academic search premier; sociological abstract; psycinfo; and ProQuest. 3rd searched google scholar, open grey 72+2 papers identified, 77 papers retrieved for full text examination and 16 papers included in the synthesis	characteristics, and environment where the main concepts common to the two groups. The need for formalization through tools such as policies and procedures and the need for professional role clarification, while, in interprofessiona l collaboration, deliberate role blurring, and flexibility are perfectly acceptable.	
Keeley, R. D. et al	2016	U.S.	None listed	Motivational Interviewing	Depressive symptoms, remission among low-income patients newly diagnosed with MDD	cluster randomize d trial	10 care teams .	Pts assessed at 6, 12, and 36 wk via PHQ-9	Training providers to frame discussions about depression using MI may improve upon standard management for depression	I

Kepler, K. L. et al	2018	U.S.	None listed	N/A	N/A	Survey	N=1527	NYC HANES 2013-14 & PHQ-9 scores	Depression is underscored in terms of societal burden and diagnosis via screening which has led to unacceptable amounts of screenings being done in terms of depression diagnosis	III
Lauria-Horner, B. et al	2018	Canada	None listed	Adult Mental Health Practice Support Program compared to treatment as usual	Improved patient depressive symptom ratings	Randomized controlled trial	N=129	Oct/13-May-15 controlled trial 77 FP practices randomized to the British Columbia. AMHPSP training, PHQ-9 over a 6month period	Training increase FP comfort and skills managing depressed patients into improved patient clinical outcomes-even in absence of mental health specialists' availability	I
Levis, B. et al	2019	Canada	None listed	PHQ-9 accuracy	Major depression	Systematic Review and Meta Analysis	Total 17357	Medline, Medline in process and other non-indexed citations, psycinfo and web of science 1/00-2/15	PHQ-9 sensitivity compared with semi structured diagnostic interviews was greater than in previous conventional meta-analyses that combined	I

									reference standards. A cut-off score of 10 or above maximized combined sensitivity and specificity overall and for subgroups	
Levis, B. et al	2020	Canada	None listed	PHQ-2 alone among studies using semi-structured, fully structured, or Mini international neuropsychiatric interview diagnostic interviews separately and in combination with PHQ-9	PHQ scores with major depression diagnoses	Meta-analysis	44,318 participants	Medline, Medline in-process, Other Non-Indexed Citations via Ovid, PsycINFO, and Web of Science (Jan 2000-May 2018) were utilized to gather studies	The combination of PHQ-2 (cutoff >2) followed by PHQ-9 (cutoff > 10) had similar sensitivity, but higher specificity compared with PHQ-9 cutoff scores of 10 or greater alone.	I
Ljungqvist, I. et al	2016	Sweden	None listed	Economic status, social relations, symptoms	Severe mental illness	Quantitative Study	N=100	Tools utilized: Hospital Anxiety and Depression Scale. Global Function Assessment Scale, Manchester Short Assessment of Quality of life,	The perceived symptoms were significantly reduced in the intervention group in the form of depression and anxiety between the baseline and the follow up taking place 67	IV

								The Visual Analogue Scale, Lancashire Quality of Life Prole,	months later. Quality of life, sense of self and social network also improved significantly. In contrast, the functional level did not improve significantly. The comparison group did not show any significant difference at all.	
Molebatsi, K., Motlhatlhedi, K., & Wambua, G.	2020	Botswana	None listed	Detection of depression in primary care	Validated screening instruments	Cross sectional	N=257 adult primary care attendants	Mini International Neuropsychiatric Interview depression module, PHQ-9	PHQ-9 is a reliable and valid instrument to screen depression in primary care facilities	V
Panaite, V. et al	2019	U.S.	None listed	Neighborhood characteristic	Patient reported outcomes for depression	Retrospective longitudinal cohort	(N=4269)	Data from VA corporate data warehouse, pt had one PHQ-9 score for 4-8 month	Neighborhood poverty should be considered along with patient characteristics when determining likelihood of depression improvement	III

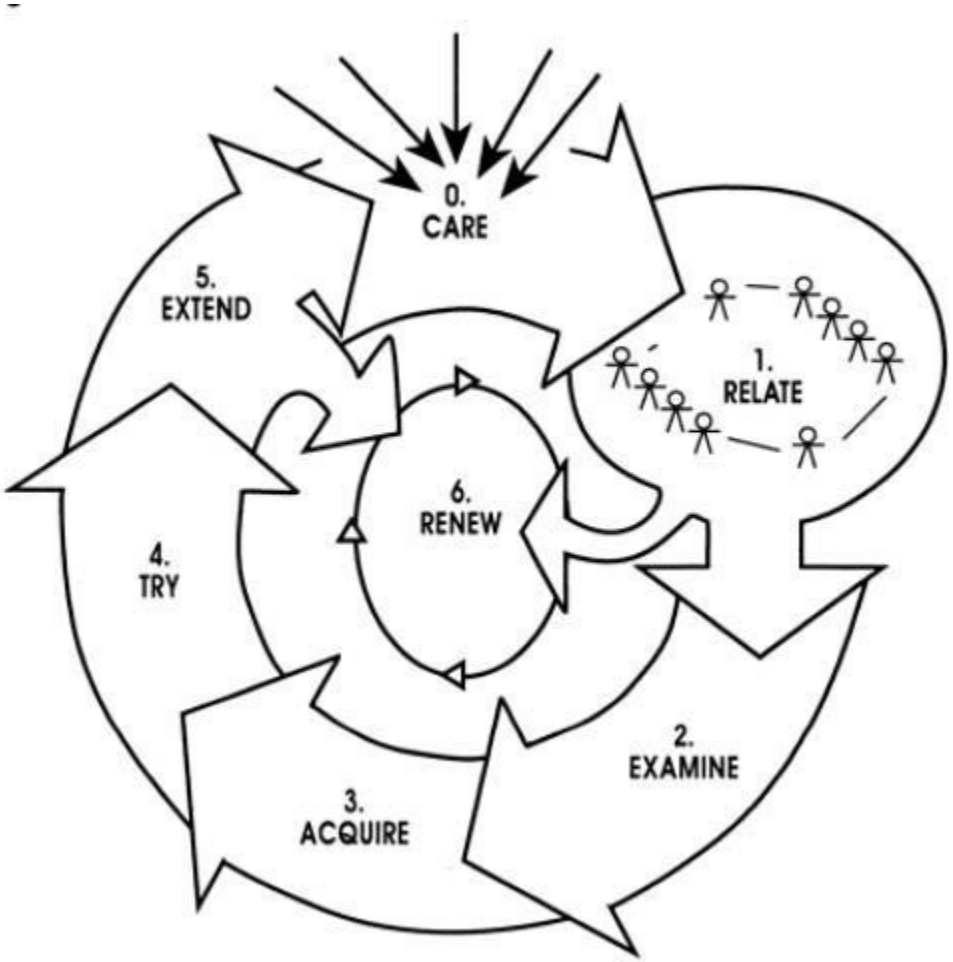
Samples, H. et al	2020	U.S.	None listed	Depression screening patterns	Diagnosis/ treatment in outpatient primary care	Cross sectional analysis	N= 16,887	05-15 National Ambulatory Medical Care Survey NCHS	Only 3% of pt sampled presenting to primary care office for a new problem or preventative care was screened. Thus, providers rely on clinical judgment to identify depression or overlook it altogether due to resources, or time constraints	V
Sikorski, C. et al	2021	Germany	None listed	Training in depression care	Patient outcome	Systematic review and meta-analysis	N=108 studies		Provider training, if combined with guideline implementation, contributes to enhanced care for depression in primary care even associated with possible positive system changes. Providing a guideline and training practitioner to adhere to guideline concordant treatment might be a measure of	I

									intervention that endures even after the intervention ends	
Shin, C. et al	2019	Korea	None listed	PHQ-8, PHQ-9	Major depressive disorder (MINI)	Retrospective Analysis	Retrospective analysis of 567 pt in psychiatric outpatient units.	Inclusion criteria patients 19 or older, new outpatient, able to read and write Korean, exclusion cognitive impairment that disabled them to answer the questionnaires appropriately, patients with underlying medical or surgical condition that could affect study evaluation. MINI and HAMD administered by clinical psychologist	The PHQ-8 shows sufficient validity to be used in screening for MDD. In addition, it shows almost no difference in its ability to screen for MDD when compared to the PHQ-9	I

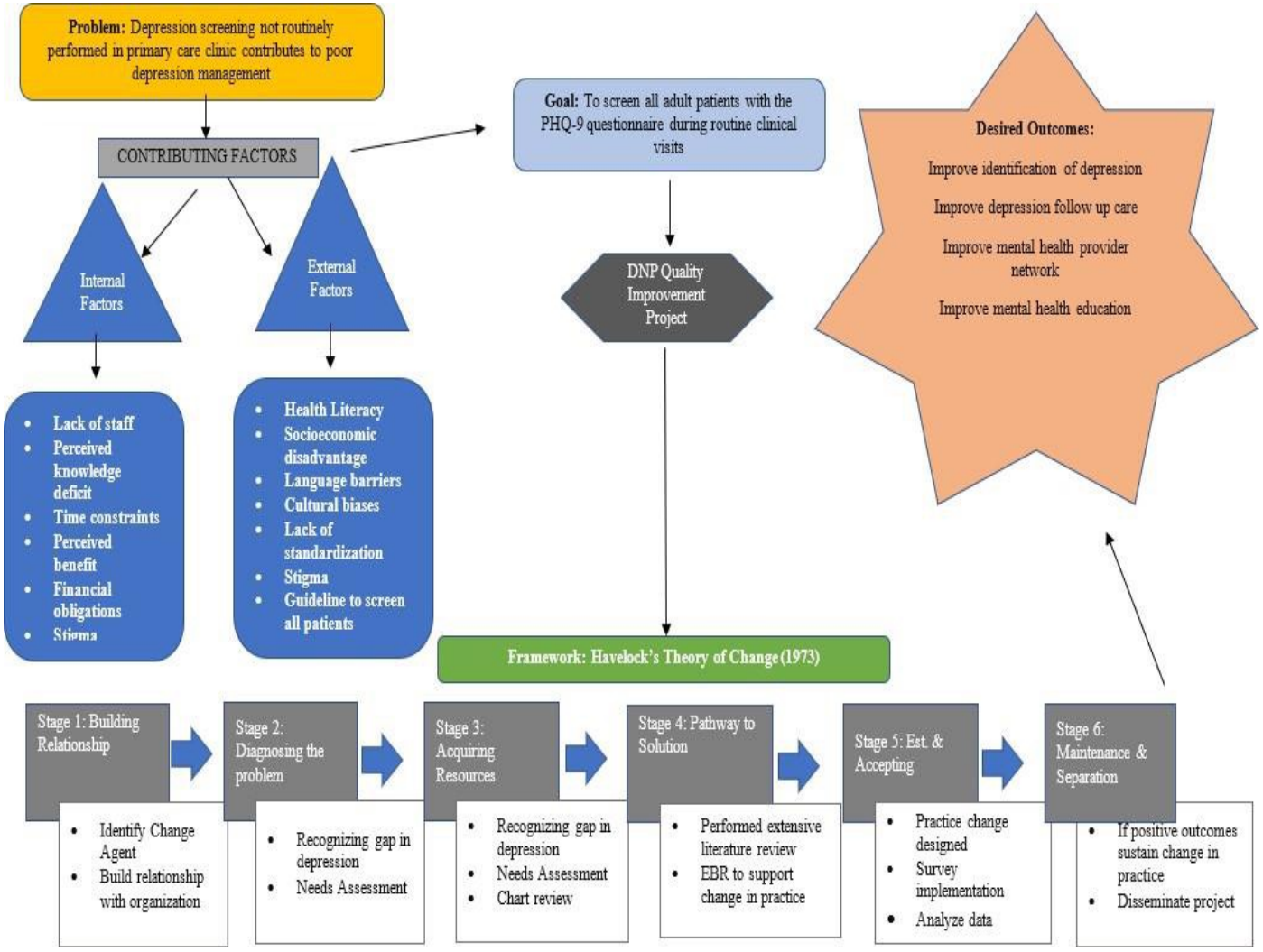
Van der Burgt, S. et al	2018	Netherlands	Self-determination theory	Work environment	Motivate or demotivate	Qualitative design	N=6 med. specialists	10hrs of observation per medical specialist was collected from the time they entered the hospital until they left the hospital. Paying special attention to whether an event, activity, or situation was motivating or demotivating via mood	Motivating medical specialists requires fulfilling the basic psychological needs autonomy, competence, and relatedness are important underlying influences.	IV

Appendix E: Theoretical Framework

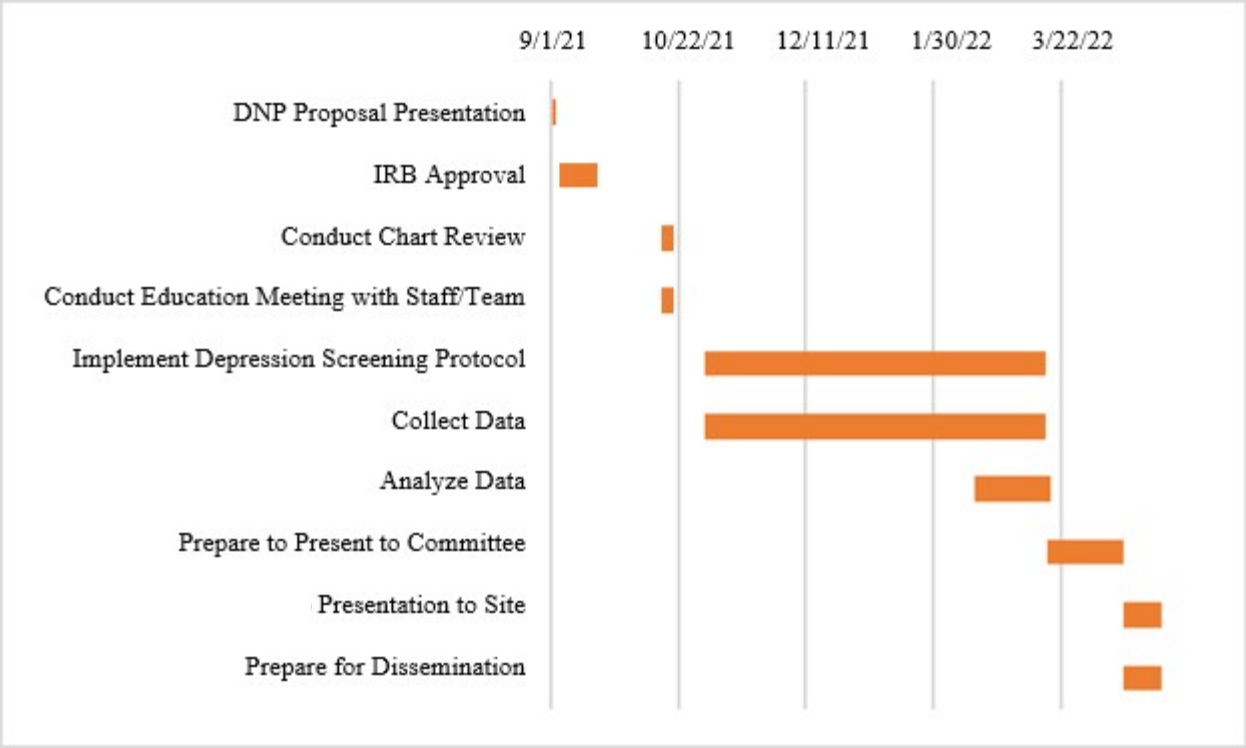
Havelock's Theory of Change 1973



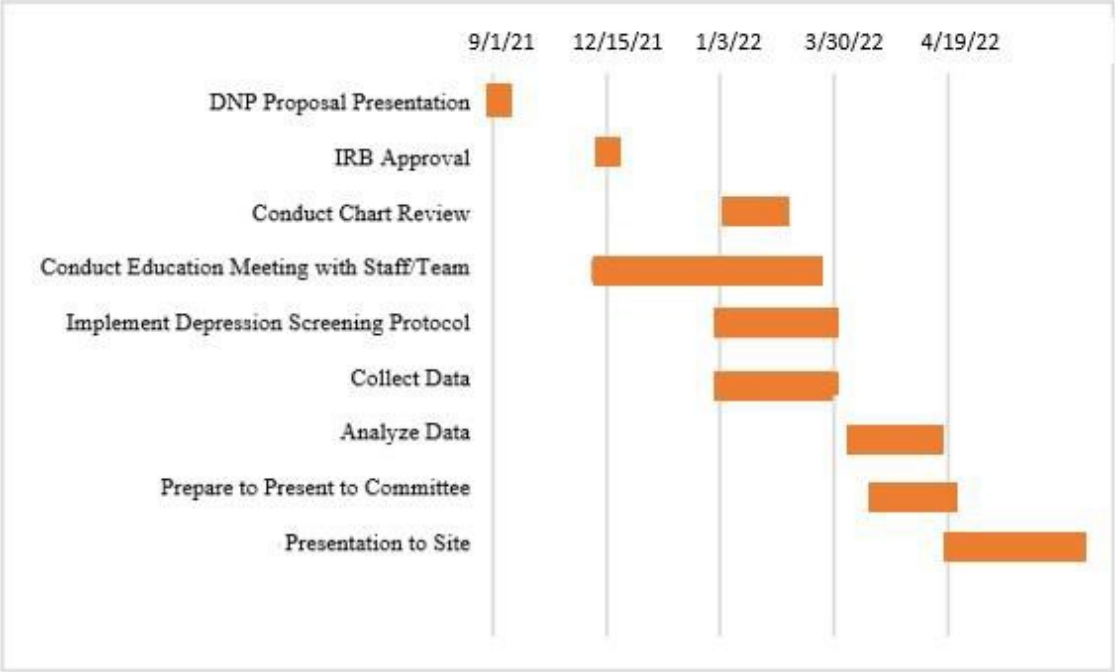
Appendix F: Concept Map



Appendix G: Initial Gantt Chart



Appendix G: Final Gantt Chart



Appendix H: Statement of Mutual Agreement for DNP Guidance

UNIVERSITY OF ARKANSAS
College of Education and Health Professions
Eleanor Mann School of Nursing

Appendix B: Statement of Mutual Agreement for DNP Guidance

DNP Student Name: Alicia Hankins Clinical Site or Agency: Good Samaritan Clinic

DNP Committee Chair: Dr. Anna Jarrett Site Champion Name & Title: Patti Kimbrough Exe. Director

DNP Project Title: Improving Depression Screening and Follow-Up Care in Underserved Populations

Expected On-Site Activities: Chart Review, Administration of PHQ-9 Survey, Clinic Staff Meetings.

Agency Approval for Presentations and Publications:

- How agency will be referenced: Good Samaritan Clinic
- Approval granted to use agency name in presentations/ publications: yes
- Approval granted to use agency name in the University of Arkansas DNP Project Scholar Works online repository: yes
- Is IRB submission required at site? ___ Yes _X_ No

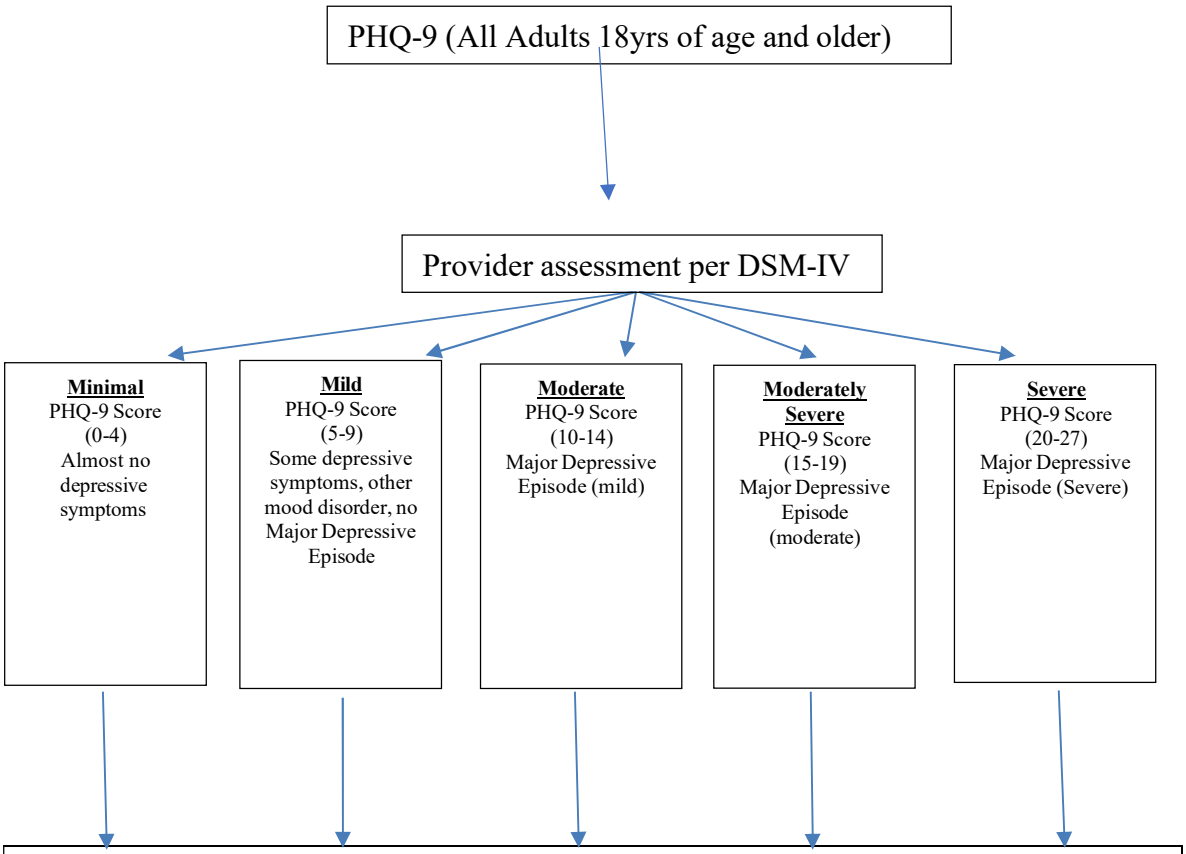
DNP Student Signature: Date: 8/26/21

Committee Chair Signature: Anna Jarrett Date: 9.2.21

Site Champion Signature: Patti Kimbrough Date: 8/24/2021

Preceptor Signature: Melissa Morton APRN Date: 8/24/21

Appendix I: Depression Decision Tree



Interventions & Plans				
Assess Suicide Risk				
Develop supported self-management plan and goals with the patient.				
Provide patient with education materials, about lifestyle changes: diet, exercise, relaxation, drug and alcohol abstinence and alcohol use)				
Monitor **Patient to contact practice if symptoms worsen.** **Establish follow-up appointment in 1 to 2 months for re-evaluation**	**Watchful waiting** **Clinic to follow up with patient within 2-4 weeks to re-evaluate symptoms.** **REC: focused psychological interventions**	**Medication** **Discuss need for antidepressants.** **Start low and go slow** **1:1 counseling** **Psychotherapy if indicated**	**Combination Therapy** **Prescribe antidepressant(s) or combination medication and psychological interventions**	**Referral** **Consider urgent psychiatric consultation** **Continue antidepressants, psychological interventions.**
Follow up every 2 to 6 weeks as appropriate to evaluate treatment response				

Appendix J: Data Collection Sheets

A Qualtrics data collection survey for the PHQ-9 questionnaire has been created

- **Depression Collection Data**
  - Depression Diagnosis
  - PHQ-9 screening completed
  - PHQ-9 score
  - PHQ-9 false positive (as identified following provider e
  - # Of medications the patient currently takes
  - Family history of depression/mental illness
  - Follow up appointment scheduled
  - Follow up appointment kept
  - Depression medication prescribed
  - Cognitive therapy prescribed
  - Both medication and cognitive therapy prescribed
  - Referral for mental health provider/crisis center
  - Depression education provided
- **Demographic Data**
  - Age
  - Sex
  - Race
  - Ethnicity
  - Education Level
  - Employment Status
  - Marial Status
  - # of people living in the home
  - # of children

Appendix K: Needs Assessment Questionnaire with Statical Analyses

The purpose of this questionnaire is to gather information regarding the diagnosis, treatment, and referral process of patients with depression. Information obtained on the questionnaire will be utilized for health improvement outcomes and depression protocols within the current patient population. All information collected will be considered confidential as no identifiable information will be collected on this form. The interview will last approximately 10 minutes unless further discussion, prompts are needed.

1. Do you feel that depression has increased?
    a. Yes (100%)
    b. No (0%)
2. If so, why?
    a. COVID (100%)
        i. Social distancing
        ii. Financial strain
        iii. Fear of getting sick
        iv. economy
3. Do you feel that patients are up front about their depression?
    a. Yes
    b. NO (100%)
4. Do you feel that there is still a stigma around depression?
    a. Yes (57%)
    b. NO (43%)
5. Do you have a referral process for depression?
    a. Yes (85.7%)
    b. No
    c. I don't know (14.2%)
6. Do you feel confident about seeing the signs/symptoms of depression?
    a. Yes (43%)
    b. No (57%)
7. What poor outcomes do you see because of poor depression management?
    a. Drinking, drugs, unemployment (42.8%)
    b. Isolation (28.5%)
    c. Suicide (28.5%)
8. Do you believe your depression screening and management process needs improved?
    a. Yes (100%)
    b. No (0%)
9. Do you feel that patients are given all the tools necessary to be successful once diagnosed with depression?
    a. Yes (43%)
    b. No (57%)
10. What is one thing you would change about depression management?
    a. Scheduling (42.8%)
    b. Education (28.5%)
    c. Referral (14.2%)
    d. Therapy (14.2%)

11. Do you feel staff are prepared to make changes to workflow processes?
    a. Yes (100%)
    b. No (0%)
12. Where do you think resistance to change will be found?
    a. Scheduling (57%)
    b. Implementation of form (43%)
13. Do you feel that management will approve depression workflow changes?
    a. Yes (100%)
    b. No (0%)
14. Are you willing to take part in the depression protocol changes?
    a. Yes (100%)
    b. No (0%)

Appendix L: PHQ-9 Questionnaire

English Version of PHQ-9

©

PATIENT HEALTH QUESTIONNAIRE-9

Over the last 2 weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING

0 + _____ + _____ + _____

=Total Score: _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

Appendix L: PHQ-9 Questionnaire

Spanish Version of PHQ-9

©

CUESTIONARIO SOBRE LA SALUD DEL PACIENTE-9 (PHQ-9)

Durante las últimas 2 semanas, ¿qué tan seguido ha tenido molestias debido a los siguientes problemas? *(Marque con un " " para indicar su respuesta)*	Ningún día	Varios días	Más de la mitad de los días	Casi todos los días
1. Poco interés o placer en hacer cosas	0	1	2	3
2. Se ha sentido decaído(a), deprimido(a) o sin esperanzas	0	1	2	3
3. Ha tenido dificultad para quedarse o permanecer dormido(a), o ha dormido demasiado	0	1	2	3
4. Se ha sentido cansado(a) o con poca energía	0	1	2	3
5. Sin apetito o ha comido en exceso	0	1	2	3
6. Se ha sentido mal con usted mismo(a) – o que es un fracaso o que ha quedado mal con usted mismo(a) o con su familia	0	1	2	3
7. Ha tenido dificultad para concentrarse en ciertas actividades, tales como leer el periódico o ver la televisión	0	1	2	3
8. ¿Se ha movido o hablado tan lento que otras personas podrían haberlo notado? o lo contrario – muy inquieto(a) o agitado(a) que ha estado moviéndose mucho más de lo normal	0	1	2	3
9. Pensamientos de que estaría mejor muerto(a) o de lastimarse de alguna manera	0	1	2	3

FOR OFFICE CODING 0 + _____ + _____ + _____

=Total Score: _____

Si marcó cualquiera de los problemas, ¿qué tanta dificultad le han dado estos problemas para hacer su trabajo, encargarse de las tareas del hogar, o llevarse bien con otras personas?

No ha sido difícil	Un poco difícil	Muy difícil	Extremadamente difícil
☐	☐	☐	☐

Appendix L: PHQ-9 Questionnaire

INSTRUCTIONS FOR USE

for doctor or healthcare professional use only

PHQ-9 QUICK DEPRESSION ASSESSMENT

For initial diagnosis:

1. Patient completes PHQ-9 Quick Depression Assessment.
2. If there are at least 4 ✓s in the two right columns (including Questions #1 and #2), consider a depressive disorder. Add score to determine severity.
3. ***Consider Major Depressive Disorder***
   - if there are at least 5 ✓s in the two right columns (one of which corresponds to Question #1 or #2).

   Consider Other Depressive Disorder
   - if there are 2 to 4 ✓s in the two right columns (one of which corresponds to Question #1 or #2).

Note: Since the questionnaire relies on patient self-report, all responses should be verified by the clinician, and a definitive diagnosis is made on clinical grounds, taking into account how well the patient understood the questionnaire, as well as other relevant information from the patient. Diagnoses of Major Depressive Disorder or Other Depressive Disorder also require impairment of social, occupational, or other important areas of functioning and ruling out normal bereavement, a history of a Manic Episode (Bipolar Disorder), and a physical disorder, medication, or other drug as the biological cause of the depressive symptoms.

To monitor severity over time for newly diagnosed patients or patients in current treatment for depression:

1. Patients may complete questionnaires at baseline and at regular intervals (eg, every 2 weeks) at home and bring them in at their next appointment for scoring or they may complete the questionnaire during each scheduled appointment.
2. Add up ✓s by column. For every ✓:
   "Several days" = 1 "More than half the days" = 2 "Nearly every day" = 3
3. Add together column scores to get a TOTAL score.
4. Refer to accompanying PHQ-9 Scoring Card to interpret the TOTAL score.
5. Results may be included in patients' files to assist you in setting up a treatment goal, determining degree of response, as well as guiding treatment intervention.

PHQ-9 SCORING CARD FOR SEVERITY DETERMINATION

for healthcare professional use only

Scoring—add up all checked boxes on PHQ-9

For every ✓: Not at all = 0; Several days = 1;
More than half the days = 2; Nearly every day = 3

Interpretation of Total Score

Total Score	Depression Severity
0-4	None
5-9	Mild
10-14	Moderate
15-19	Moderately severe
20-27	Severe

Appendix M: Pfizer Inc Press Release

Pfizer To Offer Free Public Access To Mental Health Assessment Tools To Improve Diagnosis And Patient Care
Wednesday, July 21, 2010 - 09:30pm
EDT
"We are listening to the needs of the mental health community and doing what we can to provide the tools needed to make the best possible healthcare decisions."
(BUSINESS WIRE
As part of its commitment to improving the quality of patient care, Pfizer today announced that it will make available assessment scales used by physicians and others in the healthcare community to support the evaluation and diagnosis of patients suffering from certain mental disorders. For the first time, these users can directly access and download the Patient Health Questionnaire (PHQ) and the General Anxiety Disorder questionnaire (GAD-7) without copyright restriction and at no charge, providing unprecedented access to these valuable and widely used tools for evaluating certain mental disorders.
“By providing unrestricted access, Pfizer is encouraging broader usage of these important patient assessment aids, which we know will help many healthcare providers and their patients,” said Freda C. Lewis-Hall, M.D., senior vice president and chief medical officer at Pfizer. “We are listening to the needs of the mental health community and doing what we can to provide the tools needed to make the best possible healthcare decisions.”
The PHQ and GAD scales are quick, efficient, validated methods to assist physicians in diagnosing and monitoring their patients.
PHQ-9, a widely used questionnaire, is self-administered, and utilizes a scoring method to specifically measure depression-related symptoms. In less than a decade, the PHQ-9 has become commonly used by both clinicians and researchers in large federally sponsored U.S. surveys and has been adopted as a standard measure for depression risk and severity by the Veterans Administration, Department of Defense and several integrated health care systems and public health departments as well as the United Kingdom’s National Health Service. “This is an outstanding example of how both industry and academia can work together to improve the accuracy of diagnosis and support better assessments of treatment response and outcomes,” said Darrel A. Regier, M.D., M.P.H., director, Division of Research at the American Psychiatric Association (APA). “In the United States, mental disorders are diagnosed based on the APA’s Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV). A team of experts is currently working on the fifth edition of the manual, and the PHQ-9 is being considered as one measure to be used for assessing depression severity and treatment response.”
According to the National Institute of Mental Health, mental disorders affect an estimated 26.2 percent of Americans ages 18 and older – about one in four adults suffers from a diagnosable mental disorder each year. Major depressive disorder, which affects approximately 14.8 million American adults ages 18 and older, is the leading cause of disability in the U.S. for ages 15 to 44. Approximately 40 million American adults ages 18 and older have an anxiety disorder.
More than a decade ago, Pfizer, along with research partners Robert Spitzer, M.D. and Janet Williams, D.S.W. from Columbia University and Kurt Kroenke, M.D. from Indiana University, recognized the need for and supported the independent development of dimensional measurement tools for mental disorders to be used by health care professionals. The four original studies that validated the tools represented 10,000 patients. Between 1999 and 2009, more than

560 publications on these assessment aids have been identified.
“The PHQ-9 and GAD-7 tools really are standard measures for physicians to use,” said Kurt Kroenke, M.D., one of the co-developers of the tools from the Department of Medicine, Regenstrief Institute for Health Care, and Indiana University School of Medicine. “As depression and anxiety are the most common mental disorders in primary care, the PHQ and GAD instruments are important aids for making accurate diagnoses. They propose a few scaled treatment options for physicians and patients to consider, including watchful waiting; follow-up for repeating the severity measure; counseling, follow-up and/or pharmacotherapy; and referral to a mental health specialist for psychotherapy and/or collective management, depending on the severity of the mental disorder.”
The PHQ and GAD instruments, including different variations and translations in nearly 80 languages, are available at www.phqscreeners.comThe site also provides comprehensive instruction documents, articles, a bibliography and a direct point of contact e-mail address.
Pfizer Inc: Working together for a healthier world™
At Pfizer, we apply science and our global resources to improve health and well-being at every stage of life. We strive to set the standard for quality, safety and value in the discovery, development, and manufacturing of medicines for people and animals. Our diversified global health care portfolio includes human and animal biologic and small molecule medicines and vaccines, as well as nutritional products and many of the world's best-known consumer products. Every day, Pfizer colleagues work across developed and emerging markets to advance wellness, prevention, treatments, and cures that challenge the most feared diseases of our time. Consistent with our responsibility as the world's leading biopharmaceutical company, we also collaborate with health care providers, governments, and local communities to support and expand access to reliable, affordable health care around the world. For more than 150 years, Pfizer has worked to make a difference for all who rely on us. To learn more about our commitments, please visit us at www.pfizer.com.
Contact Media:
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212-733-8926
646-299-2526
Investor Contact: Suzanne Harnett, 212-733-8009 ###
https://www.pfizer.com/news/press-release/press-release-detail/pfizer_to_offer_free_public_access_to_mental_health_assessment_tools_to_improve_diagnosis_and_patient_care

Appendix N: Consent Forms

Improving Depression Screening and Follow-Up Care in Underserved Populations

PRINCIPAL INVESTIGATOR
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PURPOSE OF PROJECT

You are being asked to take part in a Doctoral Nurse Practitioner (DNP) research project. Before you decide to participate in this project, it is important that you understand why the project is being done and what it will involve. Please read the following information carefully. Please ask the principal investigator if there is anything that is not clear or if you need more information. The purpose of this project is to improve depression recognition and management in the primary care setting. Through the administration of the Patient Health Questionnaire 9 depression screening tool and follow-up depression evaluations utilizing the Diagnostic and Statistical Manual of mental Disorders 5th edition. The aim for this quality improvement project is to improve identification of depression in at-risk adult patients through the implementation of a depression screening protocol utilizing the PHQ-9 questionnaire at an outpatient facility in rural Arkansas. The goal of the project is to increase the number of patients screened for depression utilizing a depression screening by 50% from the baseline data.

PROJECT PROCEDURES

The following are the suggested procedures that will take place:

- The patient will complete the PHQ-9 questionnaire
- The patient will be screened by the provider for depression utilizing the definition of depression from the DSM 5th edition.
- The patient will be given if deemed appropriate depression education, depression medication prescription, follow-up appointments, referral to see a specialist, and recommendation for cognitive therapy.

RISKS

There is a potential for psychological and emotional distress with completing the PHQ-9. Individuals may feel overwhelmed and/or have increased thoughts of sadness by the

information provided in the questionnaire and in the provider depression assessments due to the sensitive/personal nature of the questions asked. No personal identifiers will be stored or collected throughout the entirety of the project. Potential loss of patient privacy and confidentiality is limited but can occur. All precautions will be taken by the project investigator and facility in accordance with (Health Insurance Portability and Accountability Act of 1996) HIPAA standards.

BENEFITS

Benefits related to the study include increased depression diagnosis, prompt treatments, and management of depression. The improved diagnosis and prompt treatments can help reduce the stress and frustration felt by patients seeking care. Furthermore, screening for depression can lead to enhanced communication and strategies to improve one's mental health and wellbeing.

CONFIDENTIALITY

Your responses to the surveys will be anonymous. Please do not write any identifying information on your surveys. To assure participant confidentiality, completed surveys will be collected and stored in a locked file cabinet in the medical director's locked office. The anonymous survey material will be transcribed into a password protected data software program for analysis. All collected surveys will be promptly and properly destroyed per HIPPA guidelines at the termination of the research project. Participant data will be kept confidential to the extent allowed by law and University policy. The researcher is legally obligated to report specific incidents which include, but may not be limited to, incidents of abuse and suicide risk.

CONTACT INFORMATION

If you have questions at any time about this project, or you experience adverse effects as the result of participating in this project, you may contact the principal investigator, whose contact information is provided on the first page. If you have questions regarding your rights as a study participant, or if problems arise which you do not feel you can discuss with the Principal Investigator, please contact the University of Arkansas Institutional Review Board at 1-479-575-2208.

VOLUNTARY PARTICIPATION

Your participation in this project is voluntary. It is your decision whether to take part in this project. If you decide to take part in this project, you will be asked to complete the task from the list of project procedures as listed above. You are still free to withdraw at any time and without giving a reason. Withdrawing from this project will not affect the relationship you have, if any, with the principal investigator, the Good Samaritan, or the University of Arkansas. If you withdraw from the project before data collection is completed, your data will be returned to you or destroyed.

Appendix N: Consent Forms

Verbal Consent Script for Screening

Hello. My name is _____. We are conducting a depression screening project here at the Good Samaritan with a student from the University of Arkansas. The purpose of this research is to evaluate the effectiveness of a screening tool PHQ-9 in improving depression screening and early identification for at risk populations.

Your participation would include a short screening questionnaire to determine if you are at risk for depression. This questionnaire should take less than 5 minutes to complete. If your score indicates you are at risk for depression, your provider will discuss ways we can help you which could include providing education, medical management, or a referral for mental health services outside of the clinic. No identifying information will be collected for the purposes of this research study.

Participation is voluntary. Refusing to participate will not adversely affect any other relationship with Good Samaritan, the University, or the researchers.

Will you participate by completing this questionnaire?

Contact Information:

Principle Investigator:	Alicia Hankins RN, DNP student University of Arkansas Eleanor Mann School of Nursing 606 N. Razorback Rd. 1-479-575-3904 student email
Co-Investigator/Faculty Chair:	Anna Jarrett, PhD, ACNP-BC University of Arkansas Eleanor Mann School of Nursing 606 N. Razorback Rd. 1-479-575-3904 ajarrett@uark.edu

If you have questions or concerns about your rights as a research participant, please contact Ro Windwalker, the University's Human Subjects Compliance Coordinator, at 479-575-2208 or irb@uark.edu

Appendix O: IRB Approval

UNIVERSITY OF ARKANSAS

To:	Alicia D. Hankins
From:	Justin R Chimka, Chair IRB Expedited Review
Date:	12/15/2021
Action:	**Exemption Granted**
Action Date:	12/15/2021
Protocol #:	2110360639
Study Title:	Improving Depression Screening and Follow-Up Care in Underserved Populations

The above-referenced protocol has been determined to be exempt.

If you wish to make any modifications in the approved protocol that may affect the level of risk to your participants, you must seek approval prior to implementing those changes. All modifications must provide sufficient detail to assess the impact of the change.

If you have any questions or need any assistance from the IRB, please contact the IRB Coordinator at 109 MLKG Building, 5-2208, or irb@uark.edu.

cc: Anna Jarrett, Investigator

Appendix P: Implementation Evolution Over Time

Implementation Evolution Over Time

Implementation Timeline	Progress	New Changes
12/15/2021	UARK IRB approval	
12/26/2021	Clinic Meeting	Meeting Topics: IRB Approval, Implementation start date 1/3/2022, Depression Protocol, Survey Copied, Started paper chart review
1/3/2022	Implementation go live date	Started handing out surveys, continued chart review
1/11/2022	Interdisciplinary team meeting	Request for improved staff/patient engagement. Changed process flow to improve patient adherence
2/1/2022	Randomly surveyed patients about survey completion	Nursing students started asking patients each survey question and filling out form
2/10/2022	Education sessions	Improve depression education of student volunteers/staff. Educate on depression bias
2/15/2022	Education sessions	Improve depression education of student volunteers/staff. Educate on depression bias
2/24/2022	Chart review completed	Continued survey collection
3/3/2022	Clinic meeting	Team building exercises working on depression bias
3/8/2022	Education sessions	New interns coming into the clinic provided project details and updates
3/24/22	Implementation phase completed	

Appendix Q: PDSA Cycles

PDSA Discussion Board Worksheet		
OBJECTIVE: Is to obtain IRB approval		
Change Idea: Submit protocol revisions per IRB request		
	Person Responsible	Due Date
Plan: Submit protocol revision to IRB	Principal Investigator	11/7/2021
Do: Revisions Completed and sent to committee members for approval by 11/4/21	Principal Investigator, Committee members	11/4/2021
Study: Analyze committee members input on revisions	Principal Investigator	11/5/2021
Act: Awaiting further feedback from IRB on approval	IRB committee	undetermined

PDSA Discussion Board Worksheet		
OBJECTIVE: Publish Survey in Qualtrics's for data collection		
Change Idea: Submit data collection and survey into Qualtrics's		
	Person Responsible	Due Date
Plan: Convert data collection sheet information into patient survey form into Qualtrics's	Principal Investigator	11/18/2021
Do: Survey completed in Qualtrics's and submitted for program analysis	Principal Investigator	11/18/2021
Study: Analyze Qualtrics's feedback on survey strengths and weaknesses	Principal Investigator	11/18/2021
Act: Change survey accordingly ensuring survey is user friendly / await IRB approval	Principal Investigator	11/18/2021

PDSA Discussion Board Worksheet		
OBJECTIVE: Find learning opportunities for successful research project implementation		
Change Idea: Find and learn from past research projects for successful strategies in my project		
	Person Responsible	Due Date
Plan: Find learning opportunities in open university settings	principal investigator	11/23/2021
Do: Complete learning objectives found in course materials	principal investigator	11/24/2021
Study: learn from previous projects failures and successes are both learning opportunities to build from	principal investigator	11/24/2021
Act: Journal ideas that can improve my project and run these ideas by committee and clinical staff, Will await further guidance from IRB. Will reach out and contact IRB chair if no further communication is returned by 12/4/21 for further guidance.	principal investigator	11/28/2021

PDSA Week 1 Implementation		
OBJECTIVE: Improve Patient Survey Competition rates (PHQ-9)		
Change Idea: Identify potential reason for reduced rates of PHQ-9 completion		
	Person Responsible	Due Date
Plan: Clinical site meeting to initiate poor patient adherence issues	principal investigator	1/11/2022
Do: Staff survey administered	principal investigator	1/11/2022
Study: learned from current trends in collected data and feedback gathered from staff to make changes to improve output	principal investigator	1/11/2022
Act: Patients surveys will be in each patient room and be given to the patient in the room by RN. The front desk is too busy to provide patients with additional papers that are often left or lost from the waiting room to the patient's room, causing additional work.	principal investigator/clinical staff	1/28/2021

Improve Patient Survey Completion		
OBJECTIVE: Improve Patient Survey Competition rates (PHQ-9)		
Change Idea: Identify potential reason for reduced rates of PHQ-9 completion		
	Person Responsible	Due Date
Plan: Clinical staff meeting to further address poor patient adherence issues. Random poll of patients to seek further reasons for survey completion failures	principal investigator	2/1/2022
Do: Surveyed randomized patients at checkout inquiring about survey completion to better understand possible reasons for failure to complete. Clinical staff meeting to further address additional challenges/success with survey completion they found this week.	principal investigator/ Clinical staff	2/1/2022
Study: Collected feedback from 8 random patients throughout the day. Asking if the patients knew about the survey study, if they had enough time to complete the survey, if they felt comfortable with completing, if they understood the language/wording of the survey, if they had further input to increase survey completion. Collected staff input during clinic meeting addressing success/failures they had compiled through the week of implementation.	principal investigator	2/1/2022
Act: Research and Journal ideas to address patient feedback of being slightly rushed during the survey and not taking survey seriously due to voluntary nature of survey. Address patient feedback during scheduled clinical meetings with staff members detailing found research and ideas to circumvent problems with survey completion rates.	principal investigator/clinical staff	2/3/2022

Improve Depression Education		
OBJECTIVE: Improve depression education		
Change Idea: Improve depression education to reduce bias		
	Person Responsible	Due Date
Plan: Clinical staff meeting promoting improved depression education and reflecting on possible negative biases that could be preventing honest feedback	principal investigator	2/10/2022
Do: conducted educational depression talk with reflection on negative biases what they are how to avoid	principal investigator/ Clinical staff	2/10/2022
Study: Collected feedback from staff members on ways to reduce/prevent negative biases.	principal investigator	2/10/2022
Act: Research and Journal ideas to address depression biases. Continue to ask during weekly meetings about depression bias and comfortability of staff with depression communication/education with patients.	principal investigator/clinical staff	2/12/2022
Improve Depression Education		
OBJECTIVE: Improve depression education		
Change Idea: Improve depression education to reduce bias		
	Person Responsible	Due Date
Plan: Clinical staff meeting promoting improved depression education and reflecting on possible negative biases that could be preventing honest feedback	principal investigator	2/15/2022
Do: conducted educational depression talk with reflection on negative biases what they are how to avoid	principal investigator/ Clinical staff	2/15/2022
Study: Collected feedback from staff members on ways to reduce/prevent negative biases.	principal investigator	2/15/2022
Act: Research and Journal ideas to address depression biases. Continue to ask during weekly meetings about depression bias and comfortability of staff with depression communication/education with patients.	principal investigator/clinical staff	2/17/2022
Improve Depression Education		
OBJECTIVE: Improve depression education		
Change Idea: Improve depression education to reduce bias		
	Person Responsible	Due Date
Plan: Clinical staff meeting promoting improved depression education and reflecting on possible negative biases that could be preventing honest feedback	principal investigator	3/8/2022
Do: conducted educational depression talk with reflection on negative biases what they are how to avoid	principal investigator/ Clinical staff	3/8/2022
Study: Collected feedback from staff members on ways to reduce/prevent negative biases.	principal investigator	3/8/2022
Act: Research and Journal ideas to address depression biases. Continue to ask during weekly meetings about depression bias and comfortability of staff with depression communication/education with patients.	principal investigator/clinical staff	3/10/2022