5-7-2024

Improving Early Identification and Management of Depression Symptomology Through Implementation of Universal Depression Screening in a University Student Health Center

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IMPROVING EARLY IDENTIFICATION AND MANAGEMENT OF DEPRESSION SYMPTOMOLOGY THROUGH IMPLEMENTATION OF UNIVERSAL DEPRESSION SCREENING IN A UNIVERSITY STUDENT HEALTH CENTER

by

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EVIDENCE-BASED PRACTICE PROJECT REPORT

Submitted to the College of Nursing and Health Professions

of Valparaiso University,

Valparaiso, Indiana

in partial fulfillment of the requirements

For the degree of

DOCTOR OF NURSING PRACTICE

2024

Jessica Monjaras 5/7/2024

Student Date

DNP FNP-BC 5/7/2024

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DEDICATION

This project is dedicated to my family. Thank you to my parents, Javier and Matilde, for their endless love and support through all my educational and personal endeavors. These last few years would not have been possible without your help. Thank you for being my shoulders to cry on, always being there with open arms for a hug, and for being my biggest cheerleaders throughout the ups and downs of life. You both have always been there to support me, even on the most difficult of days when I was questioning if I could do this. You both have shown me the importance of hard work and dedication and have taught me to be proud of who I am. Thank you for believing in me always. Thank you also to my sister, Karina, for cheering me on every step of this journey and throughout my life. Your optimism, positive light, and willingness to help me in anything you could along this journey has helped me more than you can ever know. You were always willing to listen to my moments of frustration, sadness, anxiety, triumph, and happiness. I could not have gotten through this without your support. Finally, this project is dedicated to anyone who has ever struggled with depression or has been affected by a loved one who has battled with depression. As a provider I will strive to be aware and vigilant in identifying patients struggling with mental health conditions and provide them with the quality care that they deserve.

ACKNOWLEDGMENTS

I would like to thank both my project advisor, Dr. Jamie Bump, and Dr. Christina Cavinder for their guidance with this project. I would not have been able to do this without your help and support. To the project site facilitators and project site clinic staff, thank you for your kindness and support throughout this project. There were many changes along the way, and I appreciate your willingness to support and contribute to the project at each step of the process. Thank you to statistician Gregroy Gilbert, who aided with statistical data analysis for this project. I would also like to thank Sigma Theta Tau, Zeta Epsilon Chapter, for the grant which allowed me to purchase supplies to create educational components for this project and made it possible for me to attend and present my poster at the Midwest Nursing Research Society conference in Minnesota this Spring.

TABLE OF CONTENTS

LIST OF TABLES

Table **Page**

LIST OF FIGURES

Figure **Page**

ABSTRACT

Depression is the leading cause of disability in the United States for individuals aged 15 to 44 (Anxiety and Depression Association of America, 2023). The purpose of this evidence-based practice (EBP) project was to increase early identification of depression through implementation of universal depression screening, and to implement management strategies to decrease symptoms of depression. A two-tiered approach to universal depression screening was utilized through use of the PHQ-2 and PHQ-9 screening tools. Ten young adult patients, between the ages of 18 to 25, from a university student health center clinic in Northwest Indiana participated in this project. Participants underwent an 8-week intervention consisting of management strategies that included some or all the following based on a provider and patient shared decision-making process: lifestyle modification education and associated referrals, use of digital cognitive behavioral therapy (dCBT), referral to counseling services, and/or pharmacotherapy if indicated. Participants were contacted at 2, 4, and 8 weeks from baseline to obtain PHQ-9 scores and assess adherence to interventions. A paired *t* test was utilized to compare the mean baseline PHQ-9 scores to mean 8-week PHQ-9 scores. A significant decrease from baseline to eight weeks was found ($t(9)=8.10$, $p < 0.001$). These findings suggest that use of intervention strategies outlined as best practice in this EBP project contributed to a statistically significant reduction in depression symptoms. Fisher's exact test was also used to analyze the proportion of newly identified patients with depression symptomology before and after implementation of universal depression screening. There was statistical evidence of a difference between the two periods of time ($\chi^2_{(1)}=16.53$, $p<0.001$). The relative risk was found to be 2.5, meaning that patients within the implementation period ran 2.5 times the risk of depression symptoms being detected as patients before implementation. Future research should be conducted to identify barriers to implementing psychological interventions in young adult populations, and evaluation of their effectiveness in comparison to pharmacological interventions alone. Future development

of depression screening tools that are specific to a young adult patient population should also be investigated.

Keywords: Depression, cognitive behavioral therapy, counseling, lifestyle modification, pharmacotherapy, screening, young adult, university student

CHAPTER 1

INTRODUCTION

Background

Depression is one of the most prevalent mental health conditions in the United States and is the leading cause of disability worldwide (Anxiety and Depression Association of America, 2023). There are varying types of depressive disorders, the most common being major depressive disorder or major depression. Within the United States, major depression affects more than 8%, or 21 million American adults each year (Mental Health America, n.d.). Mental Health America (n.d.) describes depression as a mental health condition that causes patients to lose pleasure from daily life, can worsen other chronic conditions, and can lead to suicide. The adverse effects associated with depression account for more than $210 billion in health care costs annually within the United States (Maurer et al., 2018).

It is recognized that the factors that lead to the development of depression are multiple, complex, variable, and span both biopsychosocial and lifestyle factors (Malhi et al., 2020). Causes for depression include biological causes such as neurotransmitter imbalances, medication side effects, cognitive changes, genetic origins, trauma, life circumstances, and drug and alcohol misuse (Mental Health America, n.d.; National Alliance on Mental Illness, 2017). There are also various medical conditions that are associated with depression, mimics of depression, or co-existing conditions. Associated neurologic conditions include epilepsy, multiple sclerosis, Alzheimer disease, Parkinson's disease, cerebrovascular disease, and traumatic brain injury (Maurer et al., 2018). Other associated conditions can include cardiomyopathy, heart failure, hypothyroidism, diabetes mellitus, vitamin deficiencies, and parathyroid disorders (Maurer et al., 2018). University students in particular may be exposed to additional risk factors that can also trigger episodes of depression. Factors can include a family history of depression, peer

relationship difficulties, sexual assault, sexual identity adjustment difficulties, drug and alcohol use, and stressful personal life events (Mayo Clinic Health System, 2023).

Screening for depression is significant for early recognition, diagnosis, and management (Maurer et al., 2018). There is a lack of evidence to recommend one screening instrument over another; however, the Patient Health Questionnaire-2 (PHQ-2) and Patient Health Questionnaire-9 (PHQ-9) are most widely utilized (Maurer et al., 2018). When screening is positive for depression, the diagnosis should be confirmed with the Diagnostic and Statistical Manual of Mental Disorders-5 (DSM-V) criteria. DSM-V defines major depressive disorder as the presence of a depressed mood or loss of interest or pleasure in an individual's normally enjoyable activities which occurs along with at least four additional diagnostic criteria or symptoms for at least two weeks and causes clinically significant distress or impairment in social, occupational, other significant areas of function (Qassem et al., 2023). Additional symptoms can include poor concentration, feelings of excessive guilt or low self-worth, hopelessness for the future, thoughts of dying or suicide, disrupted sleep, changes in appetite or weight, and feeling tired or low in energy (World Health Organization, 2023). A depressive episode can be categorized as mild, moderate, or severe depending on the number and severity of symptoms, as well as the impact on an individual's daily life and functioning (World Health Organization, 2023).

In clinical practice, depression presents most often in primary care settings, first emerging from mid-adolescence and through to the fourth and fifth decade of life (Malhi et al., 2020). A significant number of individuals will experience their first episode of depression in the second decade of life, before the age of twenty (Malhi et al., 2020). For this reason, general practitioners in primary care settings play an integral role in the identification and treatment of depression.

Data Supporting Need for the Project

Global, National, Regional, and State Data

An estimated 3.8% of the global population experience depression, including 5% of adults (World Health Organization, 2023). Depression is also known to be approximately 50% more common in women than in men. According to the Anxiety and Depression Association of America (2023), approximately 75% of individuals with mental health disorders remain untreated in developing countries, and this lack of treatment at many times may lead to suicide. Globally, 700,000 individuals die due to suicide every year (World Health Organization, 2023). Specifically, suicide is the fourth leading cause of death in the 15- to 29-year-old age range (World Health Organization, 2023). Before 2020, mental health disorders were the leading cause of global health-related burden, with depressive and anxiety disorders being leading contributors. The emergence of the COVID-19 pandemic created an environment where many determinants of poor mental health were exacerbated. It is estimated that the locations that were significantly affected by the pandemic, as measured with decreased human mobility and daily SARS-CoV-2 infection rate, had the greatest increases in prevalence of major depressive disorder and anxiety disorders (Santomauro et al., 2021). It has been estimated that an additional 53.2 million cases of major depressive disorder, an increase of 27.6%, due to the COVID-19 pandemic occurred globally. In addition, major depressive disorder caused 49.4 million disability-adjusted life-years in the year 2020, which represents the number of years of healthy life lost to either mortality or disability (Santomauro et al., 2021).

Depression affects an estimated 8% of individuals within the United States and accounts for approximately more than $210 billion in health care related costs annually (Maurer et al., 2018). In the year 2020, it was estimated that 14.8 million U.S adults ages 18 or older and adolescents 12 to 17 years of age had at least one major depressive episode accompanied with severe impairment in the past year (Anxiety and Depression Association of America, 2023). Major depressive disorder is also the leading cause of disability in the United Sates for ages 15 to 44 (Anxiety and Depression Association of America, 2023). In relation to the COVID-19 pandemic, mental health concerns have increased within the United States as well. Many adults

in the United States reported symptoms of anxiety and/or depression, with approximately four in ten adults reporting symptoms in early 2021 and declined to approximately three in ten adults as the pandemic progressed (Kaiser Family Foundation, 2023).

To specifically highlight depression in the college-aged population, depression has been observed to be prevalent amount college students within the United States; however, it remains underrecognized and undertreated. Prior to the COVID-19 pandemic, the American College Health Association (ACHA) conducted a national survey and discovered that 45.1% of students reported feeling depressed, whereas only 20% of students reported being diagnosed with or treated for depression (American College Health Association, 2019). Two years into the pandemic, it was noted that mental illness increased, with 86.73% of young adults reporting moderate to severe depression (Bever & Maks, 2023).

Similar to the rest of the United States, the incidence of depression in Indiana has increased since the COVID-19 pandemic. From February 1 to 13, 2023, 32.9% of Indiana adult residents reported symptoms of anxiety and/or depressive disorder, compared to 32.3% of adults nationally (Kaiser Family Foundation, 2023). Indiana is ranked 43rd in regard to access to mental health care (Mental Health America, 2023), and 25.4% of Indiana residents reported unmet needs related to anxiety and/or depressive disorder compared to 28.2% nationally (Kaiser Family Foundation, 2023). Unmet needs are defined as an individual having a perceived or recommended need for mental health services, but not receiving care (Kaiser Family Foundation, 2023). Regarding the college-aged population, in the year 2021, 38.7% of surveyed Indiana college students indicated that they had experienced a period of significant sadness and/or hopelessness which lasted for two or more weeks (Indiana Youth Institute, 2022). Due to the outlined data, it is imperative to ensure that patients are receiving adequate screening and management for depression to improve patient outcomes.

Clinical Agency Data

The clinical site for this EBP project was a university student health center located in Northwest Indiana. The director and assistant director of the student health center, both of whom also practice as family nurse practitioners (FNPs) at the clinic, determined that there was a need to enhance screening for depression for university clinic patients. According to the director of the student health center, screening for anxiety and depression was only done on a patient complaint-based basis either prior to or during the patient visit. A standard universal screening for all patients with appointments at the clinic was not practiced (K. Eshenaur, personal communication, May 31, 2023). In addition, although the PHQ-9 was employed for screening of depression at the clinical site, the PHQ-2 was not utilized as an initial depression screening tool to indicate the need for further screening with the PHQ-9. The clinic also did not have implementation of a digital cognitive behavioral therapy self-guided program. Education on lifestyle modification was routinely discussed with the patient through conversations; however, educational material was not provided to the patient. Regarding campus resource education provided to patients, referrals to the university's campus recreation and well-being office had not been utilized for further student support (K. Eshenaur, personal communication, July 14, 2023).

The university campus where the clinical site for this EBP project is located also conducts a community well-being survey each year, and one of the focuses includes mental health concerns. One of the questions provided states if within the last year the individual had received psychological or mental health services. Of the 853 respondents on this question, 30.83% stated that they had received mental health services, either in-person or via telehealth (K. Eshenaur, personal communication, July 14, 2023). This finding also indicated that the need for mental health services is of importance, and that the early identification of mental health concerns should be of focus within the university.

The clinical site chosen has three providers, including one physician and two family nurse practitioners. The two nurse practitioners (NPs) agreed to be primary stakeholders in the project.

Additional stakeholders at the clinical site that were identified for the project included one medical assistant and one front office staff member. Due to referrals that would be initiated due to the project, additional stakeholders included the university's campus resources that are available to all students. These additional stakeholders included the university counseling center staff, the Assistant Director for Prevention and Wellness Education from the university's campus recreation and well-being office, and the student health center's registered dietician.

Purpose of the Evidence-Based Practice Project

Purpose Statement and PICOT Question

The purpose of this EBP project was to increase early identification and management of depression in a university student health center setting. This was accomplished through implementation of universal depression screening, with use of PHQ-2 and PHQ-9 depression screening tools. Implementation also included appropriate follow-up for further evaluation and management of depression symptoms utilizing evidence-based interventions and best practice recommendations. Specifically, this project was implemented to address the following PICOT question: in adults, over the age of 18, does implementation of universal depression screening, compared to no universal depression screening, improve the identification of patients with depression symptomology; and for those who screen positive for depression symptomology, does follow-up for further evaluation and management interventions as decided upon in a shared decision-making model between the patient and provider that can include some or all of the following: lifestyle modification and associated referrals, referral to counseling services, use of digital cognitive behavioral therapy, and/or pharmacotherapy if indicated improve patient's PHQ-9 scores over an 8-week period in a university student health center setting?

EBP Project Description

This EBP project focused on implementing universal depression screening and depression management interventions to improve PHQ-9 scores. Participants were recruited in the university student health center clinic during scheduled visits. The PHQ-2 and PHQ-9 were

the measurement tools utilized for screening and aided in diagnosis of depression. The PHQ-2 was provided as a component of all patients' digital intake forms. If the PHQ-2 score was 3 or greater, this triggered the need to administer the PHQ-9 screening tool. The PHQ-9 results were then scored, evaluated, and discussed with the patient by the providers. According to NICE (2022), if the PHQ-9 score is less than 16, this is indicated as less severe depression, while a PHQ-9 score of 16 or greater indicates more severe depression. The project leader and providers offered patients who screened positive on PHQ-2, and then subsequently completed PHQ-9, to schedule a follow-up appointment for further evaluation of depression symptoms. For patients that declined follow-up evaluation, they were provided with a depression information brochure and student health center contact information for reference if they decided to follow-up at a later time. For patients that accepted a follow-up evaluation, at the follow-up visit the provider evaluated the patient for depression and then the patient was provided with evidence-based practice management interventions. The patients were also invited to participate in the EBP project. Description of the project, timeframe, interventions, and education were to be provided to the patients at this time.

Depression management interventions were decided upon in a shared decision-making model between the patient and provider and included a combination of some or all of the following: education on lifestyle modifications and associated campus service referrals, use of cognitive behavioral therapy through a computer and smartphone-based application, referral to university campus counseling services, and/or pharmacotherapy if indicated. Education was provided by the providers and project leader to participants verbally and through educational pamphlets and handouts. Educational handouts included information on the digital cognitive behavioral therapy program, lifestyle modifications, and pharmacotherapy if prescribed. The providers within the clinic prescribed pharmacotherapy, specifically second-generation antidepressants, based on provider clinical judgement and patient preferences. Providers also provided referrals if indicated to the university's counseling services, registered dietician, and to

the university's campus recreation and well-being wellness office for further aid with lifestyle modifications.

The project leader followed the participants' response to management of depression symptoms over the course of eight weeks. The project leader contacted the patients via phone call to repeat PHQ-9 administration and inquire on adherence to interventions. The PHQ-9 scores were examined following the end of the implementation phase through use of a paired *t*-test of mean PHQ-9 scores. The frequency or rate of patients newly identified with depression symptomology with implementation of a universal depression screening was also assessed.

CHAPTER 2

EBP MODEL AND REVIEW OF LITERATURE

Evidence-based Practice Model

The 2017 Iowa Model of Evidence-Based Practice to Promote Excellence in Healthcare, formerly known as the Iowa Model, was chosen to guide implementation of this EBP project (Buckwalter et al., 2017; Melnyk & Fineout-Overholt, 2023). The model was developed by a team of nurses from the University of Iowa Hospital and faculty from the University of Iowa College of Nursing in 1994 and has undergone revisions over time since its creation (Duff et al., 2020). The most recent review and revision of the model occurred in 2017 (Duff et al., 2020). The revised Iowa Model consists of a multiphase change process with feedback loops that provides guidance for clinicians in making decisions regarding clinical and administrative practices that affect healthcare outcomes (Melnyk & Fineout-Overholt, 2023).

Overview of EBP Model

The revised Iowa Model includes seven steps and three feedback loops that guide clinicians through the EBP process (Buckwalter et al., 2017). The process begins by encouraging nurses and other clinicians to identify opportunities for improvement in healthcare practice. The model defines the opportunities for improvement as triggers. A trigger is identified when clinicians question current practice or recognize an area in need of improvement due to newly disseminated evidence (Melnyk & Fineout-Overholt, 2023). The identification of a trigger also allows for the first opportunity to identify stakeholders that will have expertise and access to resources and support for a practice change (Melnyk & Fineout-Overholt, 2023). The revised Iowa model added a new step which urges the user to state their purpose or question. When a trigger is identified, the user should define a clearly stated objective that determines the leader of the team and specifies clear boundaries. The essential components of the purpose statement

should include the clinical problem, patient population, setting, intervention, comparison, and preferred outcome in a PICOT format (Melnyk & Fineout-Overholt, 2023).

When the purpose statement has been established, the revised Iowa model utilizes a feedback loop to determine if the topic in question is a priority to the organization. Once there is a commitment to addressing a specific topic, the next step in the model is to form a team. A team is formed to design, implement, and evaluate the practice change (Melnyk & Fineout-Overholt, 2023). A team consists of stakeholders that may include nursing staff, unit managers, advanced practice registered nurses (APRNs), interprofessional colleagues, and organizational leadership (Melnyk & Fineout-Overholt, 2023).

After a team is formed, they assemble, appraise, and synthesize a body of evidence by conducting a systematic review of literature and collecting the highest levels of evidence to support the practice change. The second feedback loop is presented at this step and the team determines if sufficient evidence is available (Melnyk & Fineout-Overholt, 2023). Once the team determines that there is sufficient evidence to support a practice change, they can begin to design and pilot the practice change in the clinical setting (Melnyk & Fineout-Overholt, 2023)

Once the pilot change is designed, the team then implements a pilot change. A pilot change aids determining outcomes in a controlled environment with a homogenous group of patients in order to identify issues before the practice change is implemented on a larger scale (Melnyk & Fineout-Overholt, 2023). Following the pilot, a third feedback loop is utilized to review the results of the pilot and determine if the practice change is appropriate beyond the pilot stage. If the results do not support a change, then revising the design of the pilot may be necessary (Melnyk & Fineout-Overholt, 2023). If the pilot results are positive, the practice change may be expanded to cover a larger proportion of the organization in question (Melnyk & Fineout-Overholt, 2023). When a positive outcome is reached, essential personnel should be engaged to sustain the practice change. The model suggests integration of the practice change into daily care provided by the organization (Melnyk & Fineout-Overholt, 2023). Sustainability of the new

change is promoted by local champions, leadership support, educational programs, and continuous monitoring of outcomes (Melnyk & Fineout-Overholt, 2023). The final step of the Iowa model is dissemination of results. This step is accomplished through sharing of project reports both within and outside of the organization through presentations and publications (Melnyk & Fineout-Overholt, 2023).

The revised Iowa model was chosen to guide this EBP project because it creates a streamlined approach to addressing practice change. Within the university student health clinic setting in which this EBP project took place, previous standards were questioned regarding depression screening and management. It was observed that the standard of care at the clinic had consisted of only screening patients for depression when they presented for a mental-health related complaint. Because the clinic was not expanding depression screening for all patients as recommended, it was questioned if providers may not be addressing all patients with depressive symptomology and therefore not adequately treating patients with depression. This led to the question if a universal screening standard would capture more patients with depressive symptoms and in doing so lead to earlier intervention and management. An intervention to support universal screening of depression and an intervention for the management of depression symptoms was supported by key stakeholders at the clinical site, and the need for practice change was supported by clinical guidelines and current evidence. The team formed included the following: the project leader, two nurse practitioners (NPs), and one medical assistant. Due to the smaller size of the clinic in which the project was conducted, this model was considered appropriate for this project.

Literature Search

Sources Examined for Relevant Evidence

A Research Services librarian assisted with an extensive and exhaustive literature search to determine the best practices for screening and managing depression in young adults in a university student health clinic setting. Databases searched included Joanna Briggs Institute

EBP Database (JBI), Turning Research Into Practice (TRIP), Cochrane Library, Cumulative Index to Nursing and Allied Health (CINAHL), MEDLINE with Full Text (via EBSCO), PsychInfo, and U.S. Preventative Services Task Force (USPSTF). The resulting references found in the databases were carefully examined by the project leader to ensure appropriate evidence was chosen to support the EBP project.

Exclusion criteria were developed and utilized for evidence identified from all databases. Exclusion criteria included evidence that did not include an intervention that supported the PICOT question, literature that described interventions that could not be conducted in a primary care setting, literature that focused on depression in conjunction with other comorbidities, and literature that focused on pediatric patients, adolescent patients, older adult patients, pregnant patients, and post-partum patients. Any sources that were duplicated within the searched databases were manually excluded by the project leader. Only studies that had been completed were included for review as the results determine applicability to practice. Inclusion criteria included studies conducted in primary care settings and student health clinic settings, studies that included young adults typically considered to be between the ages of 18 to 25 years, studies that focused on university or college students, and studies that focused on the topics of depression, depression symptoms and major depressive disorder. After a thorough review of eligible pieces of literature, 17 pieces of evidence were selected for inclusion to support this EBP project and address the PICOT question.

The first database searched was JBI. The search included “depression” as the keyword. The search was limited to the following: a “title” limiter for the keyword, a publication year between 2018 and 2023 and publication types which included best practice information sheets, evidence summaries, recommended practices, and systematic reviews. Of the 209 results, 3 pieces of evidence were chosen for inclusion to support the EBP project after careful review, screening, and application of exclusion criteria. A similar search was conducted through the Cochrane Library by searching “depression” as the keyword. Limiters included use of a record

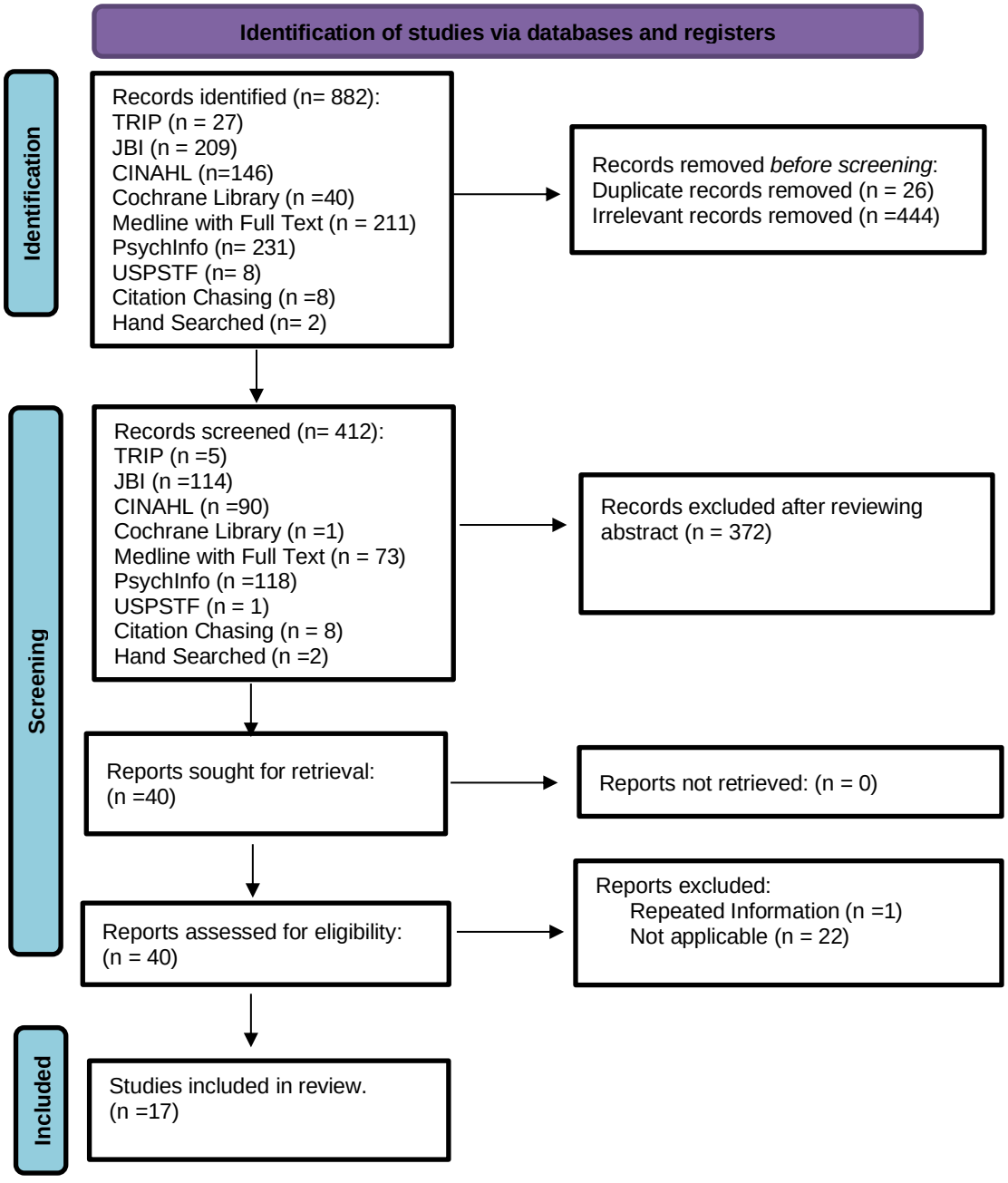
title limiter, publication between January 2018 and July 2023, and limiting publication type to reviews. The search yielded 40 results; however, the project leader did not include any pieces of evidence from this database after exclusion criteria were applied. The TRIP database was utilized to search for clinical practice guidelines (CPGs). The search in TRIP included “title: depression AND treat* OR manage* OR screen* OR “best practice” OR interven* OR diagnos*”. The search was limited to five years and CPGs only. The search within TRIP yielded 27 results, of which six relevant results were chosen for inclusion. The USPSTF database was also explored to search for CPGs and recommended practices. The search included “depress*” as a keyword. The limiters included the following: a published status, a mental health conditions and substance abuse category, an adult age group, and a counseling, preventative medication, and screening focus. The search yielded 8 results, and one was selected for use in support of the EBP project.

Because databases such as CINAHL, MEDLINE, and PsychInfo have an abundance of evidence available, the search terms were expanded to include additional keywords and subject headings. For the CINAHL database, the search included the following keywords: (MM “Depression”) AND (MM “Students, College”) AND manage* OR treat* OR screen* OR “best practice” OR interven* OR diagnos*. The search was limited to the English language, scholarly (peer reviewed) journals, and a five-year limiter (2018 to 2023). The search yielded 143 results and 2 pieces of evidence were selected. The MEDLINE search included the following keywords: (MM “Depression”) OR (MM “Depressive Disorder, Major”) AND manage* OR treat* OR screen* OR “best practice” OR interven* OR diagnos* AND “college student*” OR “university student*”. The search was limited to the English language, scholarly (peer reviewed) journals, a five-year limiter (2018 to 2023), and a young adult age range between 19 to 24 years of age. The search yielded 211 results, and one piece of evidence was included after exclusion criteria were applied. The final database searched was PsychInfo. The search included the following: (MM “Major Depression”) AND (MM “College Students”) AND manage* OR treat* OR screen* OR “best

practice” OR interven* OR diagnos*. The search was limited to the English language, scholarly (peer reviewed) journals, and a five-year limiter (2018 to 2023). The search generated 224 results with only one piece of evidence meeting inclusion criteria.

Following the application of inclusion and exclusion criteria to the selected literature, five more pieces of evidence were chosen through citation chasing. A PRISMA flow diagram, as seen in Figure 2.1, was created to depict references that were identified, examined, and included in this project.

Figure 2.1



Levels of Evidence

Melnyk and Fineout-Overholt's (2023) Hierarchy of Evidence was utilized to aid in the determination of evidence to be included and to determine which pieces of evidence are considered reliable in addressing the clinical question. The hierarchy of evidence ranks evidence from Level I evidence to Level VII evidence, with Level I evidence being the strongest evidence

and Level VII being the weakest evidence attainable. For this EBP project, there were 17 total pieces of evidence utilized for the literature review and determination of best practice. Level I, Level II, and Level VI evidence were chosen to support the PICOT question: (a) six clinical practice guidelines (APA, 2019; Malhi et al., 2021; Malhi et al., 2020; NICE, 2022; Qaseem et al., 2023; USPSTF, 2023), (b) three evidence summaries (Aginga, 2022; Slade, 2021a; Slade, 2021b), (c) one combined systematic review and meta-analysis (Karyotaki et al., 2021), (d) one MA (Andrews et al., 2018), (e) three randomized control trials (Löbner et al., 2018; McCloud et al., 2020), (f) two quality improvement studies (Bever & Maks, 2023; Slabaugh et al., 2018), and (g) one quasi-experimental study (Yates et al., 2020). The author, database, and level of evidence of each source are illustrated in Table 2.1.

Analysis and Appraisal of Relevant Evidence

After determining the level of each piece of evidence, an evidence appraisal was conducted. The evidence appraisal tools utilized for this EBP project were the Appraisal of Guidelines for Research & Evaluation II (AGREE II), the quality ranking system of the Johns Hopkins model, and applicable Melnyk and Fineout-Overholt Rapid Critical Appraisal Questions. This combination of tools was necessary due to not all tools being applicable to all study types or levels of evidence.

Six pieces of evidence were considered to be clinical practice guidelines; therefore, these sources were appraised using the AGREE II tool. The AGREE II instrument was developed by a group of international guideline developers and researchers with an objective of assessing the quality of clinical practice guidelines (AGREE Next Steps Consortium, 2009). This tool was chosen because it is a validated assessment tool, simple to follow, and it is also the only appropriate tool for appraising clinical practice guidelines. Analysis and appraisal of nine pieces of evidence selected were graded based upon the quality rating system of the Johns Hopkins model for which approval to utilize the model was received (Appendix A). Within this rating system, evidence is appraised utilizing a grading system and assigned a grade of A, B, or C. The

possible assigned grades are in descending order with A being of high quality and C depicting evidence that is of low quality with major flaws (Dang & Dearholt, 2017). The Johns Hopkins model was selected for ease of use and a clear definition and rationale regarding assignments for quality. Two pieces of evidence were appraised by utilizing the Melnyk and Fineout-Overholt Rapid Critical Appraisal Questions for EBP QI Projects (Melnyk & Fineout-Overholt, 2019). This appraisal tool was selected for ease of use, and it is also the only appropriate tool for the appraisal of quality improvement studies.

When strictly placing attention to the level of evidence, some of the evidence selected for this EBP project can be considered as lower levels of evidence as evaluated by the Melnyk and Fineout-Overholt (2023) hierarchy of evidence. However, the appraisal process demonstrated that the selected quality improvement project evidence and the quasi-experimental study were relevant and applicable for the selected clinical setting and population. Table 2.1 serves as a summary of the quality of evidence and the appraisal tools utilized. The evidence table with a summary of findings can be found in Appendix B.

Table 2.1

Summary of Evidence

Author/yr	Database(s)	Level of Evidence/Type	Quality/Tool
Aginga (2022)	JBI	I/ES	B/Johns Hopkins
Andrews et al. (2018)	Citation Chased	I/MA	A/Johns Hopkins
APA (2019)	TRIP	I/CPG	High Level/AGREE II
Bever & Maks (2023)	CINAHL	VI/QI	Consider Evidence With Confidence/ Melynk & Fineout-Overholt

Karyotaki et al. (2021)	Citation Chased	I/SR&MA	A/Johns Hopkins
Löbner et al. (2018)	Citation Chased	II/RCT	A/Johns Hopkins
Malhi et al. (2021)	Citation Chased	I/CPG	High Level/AGREE II
Malhi et al. (2020)	Hand Searched	I/CPG	High Level/AGREE II
McCloud et al. (2020)	MEDLINE	II/RCT	A/Johns Hopkins
McDermott & Dozois (2019)	PsychInfo	II/RCT	A/Johns Hopkins
NICE (2022)	TRIP	I/CPG	High Level/AGREE II
Qaseem et al. (2023)	TRIP	I/CPG	High Level/AGREE II
Slabaugh et al. (2018)	Citation Chased	VI/QI	Consider Evidence With Confidence/ Melynk & Finout-Overholt
Slade (2021a)	JBI	I/ES	A/Johns Hopkins
Slade. (2021b)	JBI	I/ES	B/Johns Hopkins
USPSTF (2023)	USPSTF	I/CPG	High Level/ AGREE II
Yates et al. (2020)	CINAHL	VI/QE	B/Johns Hopkins

Note. CPG = clinical practice guideline, ES = evidence summary, MA = meta-analysis, SR= systematic review, QE= quasi-experimental, QI = quality improvement, RCT = randomized control trial

Construction of Evidence-based Practice

Synthesis of Critically Appraised Literature

To address the clinical question, 17 relevant and critically appraised pieces of evidence were selected and synthesized into four themes. The four themes for the screening and management of depression in a university student health center setting include: (a) standardized depression screening, (b) psychological interventions including cognitive behavioral therapy (CBT) and counseling, (c) lifestyle modifications, and (d) pharmacotherapy.

Standardized Depression Screening

The USPSTF (2023) concludes with moderate certainty that screening for major depressive disorder in adults has a moderate net benefit. Throughout the literature, various tools were utilized for the purpose of depression screening. For the young adult and university student patient population, the Patient Health Questionnaire-9 (PHQ-9) was commonly utilized, as most evidence appraised for this EBP project utilized the questionnaire for screening (Bever & Maks, 2023; Löbner et al., 2018; NICE, 2022; Slabaugh et al., 2018; Yates et al., 2020). NICE (2022) utilizes PHQ-9 scores to define two categories of depression, less severe and more severe, for purposes of management and treatment recommendations. Less severe depression encompasses subthreshold and mild depression and is noted as a score less than 16 (NICE, 2022). More severe depression is defined as a PHQ-9 score of 16 or greater and encompasses moderate and severe depression (NICE, 2022).

According to the USPSTF (2023), there is minimal evidence regarding optimal timing or screening intervals for depression screening. Due the absence of this evidence, a preferred approach can include screening adults who have not been screened previously and utilizing clinical judgment while considering risk factors, comorbid conditions, and life events to determine if additional screening of patients at an increased risk is warranted (USPSTF, 2023).

Evidence has addressed that mental illness among college students can be accomplished in college health clinics through evidence-based depression screening and referral protocol development (Bever & Maks, 2023; Slabaugh et al., 2018). The literature has also shown that mass or standardized screening, rather than complaint-based screening is preferred due to typical low detection rates across campuses when utilizing standard practice (Bever & Maks, 2023; Slabaugh et al., 2018). In a college student health clinic setting, it was identified that the recommended screening tools include the Patient Health Questionnaire-2 (PHQ-2) and PHQ-9, with the PHQ-2 administered initially for a nonmental health visit followed by the PHQ-9 if the PHQ-2 is positive (Bever & Maks, 2023; Slabaugh et al., 2018). Protocols in this setting include

adding PHQ-2 to a clinic's intake forms. This process ensures that every student is screened for depressive symptoms regardless of the intent of the appointment (Bever & Maks, 2023; Slabaugh et al., 2018). The PHQ-2 includes the first two items of the PHQ-9 and inquires on the frequency of which the patient has experienced little interest or pleasure in the past two weeks and the degree to which the patient has felt down, depressed, or hopeless over the past two weeks (Bever & Maks, 2023; Slabaugh et al., 2018).

The purpose of the PHQ-2 is not to establish a diagnosis of depression or to assess the severity of depression, but rather to screen for the possibility of depression (Bever & Maks, 2023; Slabaugh et al., 2018). Based on the evidence, patients who screen positive on the PHQ-2 is noted by the score cut off point of 3 or greater (Bever & Maks, 2023; Slabaugh et al., 2018). If a patient screens positive on the PHQ-2, they will then receive the PHQ-9, which addresses seven additional topics, including sleep, energy, appetite, self-harm, and suicidal ideation (Bever & Maks, 2023; Slabaugh et al., 2018). Once completed the PHQ-9 is scored and evaluated by the primary care provider and results are discussed with the patient (Bever & Maks, 2023; Slabaugh et al., 2018). In the literature, patients who score positive on the PHQ-9, depicted by a score of 10 or greater, receive referral back to the university clinic or to university counseling services (Bever & Maks, 2023; Slabaugh et al., 2018). The diagnostic validity of the PHQ-9 demonstrates a sensitivity of 88% and specificity of 88% for scores greater than 10 (Slabaugh et al., 2018). Bever & Maks (2023), assert that this protocol method was successful at increasing depression screening from an assumed 0% baseline to 98.03%. Results also suggested that this protocol was successful at increasing depression management due to a referral increase from an assumed 0% baseline to 93.33% (Bever & Maks, 2023).

It is noted in the literature that all positive screening results should lead to additional assessments to confirm diagnosis, determine symptom severity, determine history of depression, and identify any comorbid psychological issues (Malhi et al., 2020; Malhi et al., 2021; NICE, 2022; USPSTF, 2023). The major international systems utilized to diagnose depression are the

Diagnostic and Statistical Manual of Mental Disorders, 5th edition (DSM-V), and the International Classification of Diseases, 11th revision (ICD-11) (Malhi et al., 2020; Malhi et al., 2021; NICE, 2022). The DSM-V defines major depressive disorder (MDD) as having at least two weeks of mild to severe persistent feelings of sadness or a lack of interest in everyday activities (USPSTF, 2023). Depression can also present with irritability, poor concentration, and somatic complaints such as difficulty sleeping, decreased energy, and changes in appetite (Malhi et al., 2020; Malhi et al., 2021; NICE, 2022; USPSTF, 2023).

Psychological Interventions

Cognitive Behavioral Therapy (CBT)

CBT was found to be one of the most employed psychotherapy interventions for the treatment and management of depression and depression symptoms in the literature. CBT interventions focus on the patient's dysfunctional thoughts that affect behavior and functioning. It also aids patients in evaluating, challenging, and modifying their belief patterns to promote behavioral change and improve functioning (Aginga, 2022). The aim is to reduce affective symptoms (Aginga, 2022; McDermott & Dozois, 2019). Evidence suggests that CBT can be considered as one of the first line treatment options for depression and can also be utilized in combination with other treatments such as pharmacotherapy (Malhi et al., 2020; Malhi et al., 2021; NICE, 2022; USPSTF, 2023; Qaseem et al., 2020; APA, 2019). There is no evidence that CBT is more or less effective than other psychotherapies or pharmacotherapy; however, combined treatment of CBT and pharmacotherapy is significantly more effective than pharmacotherapy alone (Aginga, 2022).

CBT is versatile in that it can be implemented in various settings and through different modes of delivery. Despite the effectiveness of CBT in primary care, barriers exist that limit its use by primary care providers (Andrews et al., 2018). Although CBT has traditionally been delivered through a face-to-face visit, primary care providers are not routinely trained to implement face-to-face CBT. Time pressures and associated costs in the clinical setting also do

not allow for face-to-face CBT interventions to be executed (Andrews et al., 2018; Malhi et al., 2021). The rapidly growing field of digital CBT (dCBT) aims to reduce these barriers. Digital CBT can be accessed through a computer, tablet, or smartphone (Andrews et al., 2018; Karyotaki et al., 2021; Malhi et al., 2020; Malhi et al., 2021; Slade 2021a). Many advantages exist with dCBT including reduced costs and broader availability to patients (Malhi et al., 2020; Malhi et al., 2021; Slade 2021a). Compared to face-to-face CBT, evidence suggests that dCBT is equally as effective in reducing anxiety symptoms, depression symptoms, and quality of life (Andrews et al., 2018). Another advantage of dCBT is that it can be conducted during a timeframe that a patient finds most convenient and in any location the patient has access to an internet connection. The meta-analysis conducted by Andrews et al., (2018), reviewed studies that focused on the effectiveness of internet-delivered CBT (iCBT) and found a combined Hedges' g for major depression being 0.67 (CI 0.51-0.81). The meta-analysis expressed that maintenance of improvement of depression at follow-up was demonstrated with small but significant effect size superiority at both three to six month and nine-to-eighteen-month follow-up. These results were indicative of both short and long-term benefit of iCBT (Andrews et al., 2018).

Patients should be educated on how to utilize dCBT before beginning this intervention. This is especially significant as the responsibility for motivation to complete a dCBT program falls more heavily on the patient than in traditional face-to-face CBT (Malhi et al., 2021). A systematic review evaluated the effectiveness of guided versus unguided iCBT for individuals with depression and it was reported that guided iCBT was more effective than unguided iCBT (SMD: -0.8; 95% CI: -1.4 to -0.2) based on PHQ-9 scores (Karyotaki et al., 2021). It was acknowledged that although guided iCBT was associated with greater improvement compared with unguided iCBT on average, individuals with depression may still benefit from iCBT without therapeutic guidance (Karyotaki et al., 2021). For this reason, education on dCBT is essential for adherence and understanding of the management intervention.

Digital CBT programs often involve lessons that are interactive and supported by audio, video, or an illustrated storyline (Löbner et al., 2018; McCloud et al., 2020; McDermott & Dozois, 2019). Current applications typically contain weekly lessons, followed by specific tasks to be done in the following week. This allows patients to place what they have learned from the dCBT into practice in their daily lives (McCloud et al., 2020; McDermott & Dozois, 2019). Courses can also track symptom levels and aid the individual in staying engaged in dCBT intervention (McCloud et al., 2020; McDermott & Dozois, 2019). One program mentioned in the evidence is known is *MoodGym* and evidence suggests that this self-guided dCBT program is effective in reducing depressive symptoms among patients with mild to moderate depression (Löbner et al., 2018; Slade, 2021a). It was also found that supported self-guided dCBT may encourage more active patient engagement with the program for individuals with mild to moderately severe depression (Löbner et al., 2018; Slade, 2021a).

McDermott & Dozois (2019) also utilized the *MoodGYM* dCBT program in their study. In this RCT, dCBT was compared to two other internet-delivered depression preventative programs, an attentional bias modification program and an active attentional control condition. Participants in the dCBT condition demonstrated more dramatic and continuous depressive symptom improvement between baseline and follow-up at four months (McDermott & Dozois, 2019). The Beck Depression Inventory II and the Depression Anxiety and Stress Scale 21 were utilized in this study. Participants' improvement on the scales was compared from baseline to post-intervention (6 weeks) and at four-month follow-up. The dCBT condition demonstrated significantly greater improvement than did the attentional bias modification condition on both scales at post-intervention and follow-up (McDermott & Dozois, 2019). With the Beck Depression Inventory II, the dCBT condition significantly outperformed the attentional bias modification program at post-intervention, $F (1, 668) = 2.09$, $p < .037$. In regard to follow-up, the dCBT group improved to a greater extent over time, $F (1, 688) = 11.95$, $p <.001$ (McDermott & Dozois, 2019). A structured reminder schedule was utilized in this study to aid participants in

adhering to the *MoodGYM* program. If participants did not complete a session within 24 hours, they received an automated remainder and those who still did not complete a task 48 hours later received reminder phone calls or personalized emails (McDermott & Dozois, 2019). McCloud et al., (2020) also evaluated the effectiveness of a self-guided mobile app known as *Feel Stress Free*. During the endpoint of the trial at six weeks, there was evidence that this application reduced depression symptomology (mean difference -1.56; 95% CI-2.67 to -0.44; P=.006) (McCloud et al., 2020). This study assessed participants' depressive and anxiety symptom severity at two weeks, four weeks, and at six weeks (McCloud et al., 2020).

Literature supports the conclusion that effectiveness of dCBT does not depend on severity of depression and that it is recommended that structured psychological treatment should be foundational in treatment of all depressive presentations (Malhi et al., 2020; Malhi et al., 2021; McCloud et al., 2020; NICE, 2022). Overall, the body of evidence does not suggest that CBT or dCBT produces adverse effects. It is noted that psychological interventions with any psychological treatment, such as self-guided internet-based CBT or guided internet-based interventions did not increase risk of harm, measured as worsening of depressive symptoms (USPSTF, 2023).

Counseling

It is imperative that providers discuss treatment options with patients diagnosed with depression and match their choice of treatment to their clinical needs and preferences (NICE, 2022). For this reason, it is significant that primary care providers also consider referrals to interventions that require in-person interaction between a patient and a practitioner with therapy-specific training (Malhi et al., 2020; NICE, 2022). Counseling services can also provide in-person environment in which to practice CBT (Malhi et al., 2020). Current evidence suggests that counseling can provide a focus on emotional processing and emotional meaning, to aid a patient in finding their own solutions and developing positive coping mechanisms (Malhi et al., 2020; Malhi et al., 2021; NICE, 2022). A collaborative partnership between a patient and a practitioner

with therapy-specific training can aid patients with depression symptomology gain greater understanding of themselves, their relationships, and their responses to others (NICE, 2022). Counseling services can also aid to provide an environment with empathic listening, facilitated emotional exploration, and encouragement Malhi et al., 2020; Malhi et al., 2021; NICE, 2022).

Lifestyle Modifications

Evidence suggests that certain lifestyle modifications not only reduce depression symptoms, but can also have a positive influence on overall health (Malhi et al., 2020; Malhi et al., 2021; NICE, 2022). Education on these lifestyle changes can be taught to patients in the primary care setting through use of educational pamphlets and having conversations with the patient regarding current health habits and how to modify them if indicated (NICE, 2022; Malhi et al., 2021).

Current evidence indicates that regular exercise is associated with improved quality of life and antidepressant effects (Malhi et al., 2020; Malhi et al., 2021; NICE, 2022; Slade, 2021b; Yates et al., 2020). Providing patients with an evidence-based exercise regimen can be done as a monotherapy or as an adjunct to pharmacotherapy management and/or psychotherapy in the treatment of depression (Malhi et al., 2020; Malhi et al., 2021; NICE, 2022; Yates et al., 2020) Evidence suggests moderate aerobic activity should be done at least three times weekly for at least thirty minutes (Malhi et al., 2021; Yates et al., 2020). Resistance-based exercise is also beneficial in management of depression symptoms, and a combination of aerobic and resistance exercises may be optimal (Malhi et al., 2021). It is crucial to advise patients that engaging in any type of physical activity on a regular basis can aid in enhancing their wellbeing (Malhi et al., 2020; Malhi et al., 2021; NICE, 2022).

Yates et al. (2020), examined the effect of an interprofessional collaborative process for college students treated with prescribed exercise as part of their depression management plan. A wellness coach aided each participant in identifying their preferred physical activities and established an individualized exercise plan that would incorporate each participant’s goals and

preferences. Exercise plans included a combination of aerobic, strength, and stretching movements (Yates et al., 2020). PHQ-9 was utilized for screening at baseline and at completion of at least 4 weeks of exercise. Participants also received reminders via email, text, or phone call in regard to wellness coaching appointments and encouragement to adhere to exercise plans (Yates et al., 2020). Results from this study determined that there was a statistically significant decrease in PHQ-9 scores from baseline (8.78±3.53) to follow-up assessment (5.44±2.92), t(8)= 2.46, P=.039, two-tailed (Yates et al., 2020). The mean decrease found in PHQ-9 scores was 3.33 with a 95% confidence interval ranging from 0.21 to 6.46 (Yates et al., 2020).

In addition to exercise, there are also other lifestyle modifications that are supported by evidence to improve depression symptoms. Promotion of healthy eating and the importance of sleep hygiene is crucial. Education on the reduction of consumption of tobacco and alcohol should be provided to the patient (Malhi et al., 2021; NICE 2022). While these interventions are beneficial on their own for improvement of depression symptoms, they are often utilized in combination with CBT, counseling, and/or pharmacotherapy (Malhi et al., 2021; NICE 2022).

Pharmacotherapy

Primary care providers most frequently prescribe second-generation antidepressants (SGAs) for initial treatment of depression (Qaseem et al., 2023). Although this is true, approximately 70% of patients with major depressive disorder do not achieve remission and remain in the acute phase after initial medication treatment (Qaseem et al., 2023). This supports the need for additional interventions in combination with pharmacotherapy such as CBT and lifestyle modifications. Literature suggests that for initial treatment of adult patients with depression, following a shared decision-making process with consideration of the patient's prior treatment response, comorbidities, costs, and risk of adverse effects is recommended (APA, 2019; Malhi et al., 2021; NICE, 2022; Qaseem et al., 2023). APA (2019) recommends two options to consider for initial treatment. The first recommended option includes the clinician offering either psychotherapy or a SGA. The second recommendation option denotes that if

considering a combination treatment, the panel recommends CBT in addition to a SGA (APA, 2019). SGAs include selective serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs), serotonin modulators, and atypical antidepressants (Qaseem et al., 2023).

Guidelines provided by NICE (2022), recommend against routinely offering medication for mild to moderate depression, defined in the guideline as a PHQ-9 score of less than 16. If the patient prefers medication, SSRIs are recommended. For more severe depression, defined as a PHQ-9 score 16 and greater within the guideline, a combination of CBT and an antidepressant (SSRI or SNRI) is recommended (NICE, 2022). When a clinician offers medication as a treatment option, it is important to discuss and agree on a management plan with the patient. This education should include a conversation regarding the following: the reasons for offering medication, choices of medication, the dose, how the dose may need to be adjusted, benefits, harms, and any concerns the patient may have in regard to taking or stopping the medication (Malhi et al., 2021; NICE, 2022). Patients should also have information regarding side effects of medication, how long it takes to see an effect, when their first follow-up appointment will be, adherence to medication, how long treatment will be, and withdrawal symptoms if a medication dose is missed or discontinued (Malhi et al., 2021; NICE, 2022). It is also important that providers be aware of the risk of suicidal thoughts in young adults when starting an antidepressant, and the patient should also be educated on actions to take if they experience suicidal thoughts (NICE, 2022).

For all patients with depression under a treatment or management plan, review of how well a treatment is working for the patient should be done between two and four weeks after starting treatment (NICE, 2022). A routine outcome monitoring utilizing an appropriate validated tool, such as the PHQ-9, should also be utilized at follow-up (NICE, 2022).

Recommendation for Best Practice

According to the synthesis of evidence, standardized depression screening should be

utilized in a university student health center setting. In addition, the best practice for addressing the clinical problem regarding management of depression symptoms includes the use of some or all of the following: lifestyle modifications, CBT, counseling services, and/or pharmacotherapy if indicated. Regarding screening, the PHQ-2 and PHQ-9 should be utilized. If a patient screens positive on the PHQ-2, the PHQ-9 should then be administered (Bever & Maks, 2023; Slabaugh et al., 2018). Once completed the PHQ-9 should be scored and evaluated by the primary care provider (Bever & Maks, 2023; Slabaugh et al., 2018). The resulting score determines depression symptom severity and aids in creation of a treatment plan. The interventions for management of depression should also be determined for each patient through a shared decision-making process between the provider and patient.

CBT should be conducted through a smartphone or internet-based computer application. Within the literature, *MoodGYM* was identified as a dCBT application that has aided in the reduction of depressive symptomology (Löbner et al., 2018; McDermott & Dozois, 2019). However, *MoodGYM* does have an associated cost to subscribe and utilize the platform. Due to this reason the program formerly known as Therapy Assistance Online (TAO) Connect, Inc.©, now known as TAO by UpLift ©, was chosen as the platform for dCBT. In March 2024, after the implementation of this EBP project had taken place, it was announced that UpLift, Inc.©, a behavioral health company which provides virtual therapy and psychiatry appointments, had acquired TAO Connect, Inc.© (Gonzales, 2024). TAO by UpLift ©, is a digital platform of tools and educational materials to aid in improvement of mental health, wellness, and life functioning (Therapy Assistance Online, 2019). TAO by UpLift © is free of charge for the university clinic setting in which this EBP project took place. The platform includes various modules focused on mental health and modules specifically focused on CBT for depression. According to Therapy Assistance Online (2019), TAO users of CBT (depression) across five sessions were found to have a significant linear trend in improvement, $F(4,1624)=21.85$, $p < .0001$.

Lifestyle modifications and associated education should also be employed for depression symptom management. Evidence demonstrates that regular aerobic exercise, adherence to a proper diet, and limiting the consumption of tobacco and alcohol aid with reduction of depressive symptomology (Malhi et al., 2021; NICE, 2022). A self-reported log should be completed during the same time PHQ-9 scores are collected to determine if patients are completing exercise and nutrition recommendations.

Pharmacotherapy can be employed if indicated based on depression severity in each individual patient case. Although there are many medication options available, an SSRI or SNRI can be a first line treatment option (Malhi et al., 2021; NICE, 2022; Qaseem et al., 2023). Guidelines provided by NICE (2022), recommend against routinely offering medication for mild to moderate depression, defined as a PHQ-9 score of less than 16. If the patient prefers medication, SSRIs are recommended. For more severe depression, defined as a PHQ-9 score 16 and greater, a combination of CBT and an antidepressant (SSRI or SNRI) is recommended (NICE, 2022). If a medication is prescribed, education regarding side effects, basic mechanism of action, follow-up, and contraindications should be provided to the patient (NICE, 2022).

Lastly, referrals to campus counseling services, registered dietician, and campus wellness office for well-being consultations should be provided if indicated by each participant case. To support the participants in the use of the evidence-based practice interventions, a follow-up protocol should also be adhered to. A self-reported log completed during the same time PHQ-9 scores are collected aids in monitoring if patients are completing recommended management interventions that are determined through a shared decision-making process between the provider and participant. Follow-up with patients in person or via telephone call over the course of eight weeks aids with adherence, monitoring of patient progress, and decreases attrition.

CHAPTER 3

IMPLEMENTATION OF PRACTICE CHANGE

The purpose of this EBP project was to increase early identification and management of depression in a university student health center setting by improving screening and management of depression symptoms utilizing evidence-based interventions and best practice recommendations. In the beginning of the planning process, the project leader met with key stakeholders to discuss potential clinical issues. When the identified issue was agreed upon, the clinical workflow was analyzed in relation to how the project would be implemented. The process was discussed with two FNP providers to ensure it was feasible and would not disrupt existing workflow. A PowerPoint presentation was utilized to organize and educate clinic providers and clinic staff regarding depression screening processes, participant recruitment criteria, and EBP project interventions. Feedback from key stakeholders in the clinic was considered and revisions were made to the planned implementation protocol and documents.

Participants and Setting

Implementation of this EBP project took place at a university student health center located in Northwest Indiana. This student health center provides services that are focused on delivering primary health care to students. Services include administration of immunizations, wellness exams, and problem-focused visits. This clinic is staffed by a physician, two FNPs, a medical assistant, and a receptionist. One of the FNP's serves as the health center director and another FNP serves as the health center's assistant director. The two FNPs agreed to participate in this EBP project.

The population of interest for this project were adult college students aged 18 years and older who presented to the student health center for an appointment within the clinic. Inclusion criteria included the following: the patient must be 18 years of age and older, obtain a score on the PHQ-2 that is greater than or equal to 3 which will then require completion of the PHQ-9

screening tool, patients who present to the student health center for all appointments including those scheduling appointments for a new encounter related to a mental health complaint, and ability to speak and understand both verbal and written English. Participants that were to be excluded from participation in the project included patients younger than 18 years of age, patients who after assessment would be deemed to be at risk of harming themselves or others and therefore require immediate referral to a higher level of care, and patients with mental-health related appointments that were already receiving treatment for their mental-health related diagnosis.

Pre-Intervention Group Characteristics

All student health center patients 18 years and older with appointments to the health center were provided with the PHQ-2 as a component of their digital intake forms, except for those who were already receiving treatment at the health center for their mental-health related diagnosis as they are always screened with the PHQ-9 according to clinic protocol. During the implementation of the universal depression screening, 25 students screened positive on the PHQ-2 and PHQ-9 and were determined to be newly identified with depression symptomology. Of the 25 patients who screened positive, 10 patients accepted further evaluation, management, and participation in this EBP project. The ten participants recruited for this project were young adults, with ages ranging from 18 to 25 years of age. Participants included 5 female participants, 4 male participants, and 1 participant who identified as gender variant/non-conforming. The race/ethnicity of participants varied from Caucasian or White, to Asian, and Hispanic/Latino or Spanish origin. The participants' university grade level ranged from freshman students to graduate level students. In addition, it was determined that participants in the project included 5 international students and 5 domestic students.

The project leader and two FNP providers utilized the student health center's electronic medical record (EMR), AdvancedMD, to determine the proportion of newly identified patients with depression symptomology before implementation of universal depression screening from the

period between September 11, 2022, and December 1, 2022. It was found that out of a total number of 779 patients seen during that timeframe, 8 students were newly identified with depression symptomology.

Intervention

Before the EBP project implementation began, education was provided to the clinic providers and staff regarding screening protocol and EBP project intervention strategy. The project leader also met with the university's counseling center services, university's wellness office, and the university student health center's registered dietician. Meetings with these resources served as an opportunity to discuss project interventions and referrals that may be forwarded to their services due to implementation of the project. The digital PHQ-2 intake form and a referral form were implemented into the student health center EMR system by the FNP assistant director. The workflow of the clinic was also assessed before implementation of the EBP project and throughout the implementation of the intervention. A process flow chart related to clinic intervention implementation of best practice can be viewed in Appendix C.

All student health center patients 18 years and older with appointments to the health center were provided with the PHQ-2. The PHQ-2 was provided to patients as a component of their digital intake forms that are to be completed prior to the patient's appointment. The only exception to this process was that the PHQ-2 was not provided to those that were established patients that were already receiving treatment at the health center for their mental-health related diagnosis as they will always receive the PHQ-9 according to clinic protocol.

Currently, the student health center's EMR does not have the capability to issue an alert to indicate the need to complete the PHQ-9 due to a positive score on the PHQ-2. Due to this circumstance, the clinic's receptionist was educated on screening protocol, and she ensured that the PHQ-2 was provided and completed by the patient as part of their required digital intake forms. If the PHQ-2 score was greater than or equal to 3, this then required the clinic receptionist to provide the PHQ-9 to the patient once they presented to the clinic site. The medical assistant,

FNP providers, and project leader also assisted in ensuring that the proper screening tools were provided and completed by the patient. A bi-weekly chart review by the project leader also served as a method of assessing clinic compliance with universal screening implementation.

Once indicated depression screening was completed the patient proceeded to their appointment, at which time the provider scored and evaluated the results of the PHQ-9. Following NICE (2022) clinical guideline recommendations, PHQ-9 scores that are less than 16 are considered as less severe depression, while PHQ-9 scores of 16 or greater are considered as more severe depression. For patients who screened positive on PHQ-2, and subsequently completed PHQ-9, the provider discussed the results and offered to schedule a follow-up appointment to further discuss the mental health related concern.

During the course of implementation, it was brought to the project leader's attention that due to the student health center's limited clinical staff, it was difficult at times to ensure that clinical staff and providers provided patients who scored positive with a reminder and invitation to schedule a follow-up when the project leader was not in clinic to aid with recruitment to the EBP project. The main reason indicated was due to limited staff and limited time per appointment. Due to this reason, an educational information summary was created that could be given to patients who scored positive on the depression screening tools. This summary and a brief educational brochure were provided to eligible patients, and this served as a reminder and invitation to schedule a follow-up evaluation. This summary also served as a reminder for clinical providers to educate the patient on the depression screening results.

For patients that accepted a follow-up evaluation, at this follow-up assessment the provider further evaluated the patient for depression and provided evidence-based practice management interventions. If the patient met criteria for inclusion in the project, the providers and project leader briefly explained the EBP project to the patient and determined their interest in participating. Every participant was informed that their involvement in the project would not have an impact on the care given by the provider. The project leader and providers provided

participants with information regarding the purpose of the project, the interventions involved, and length of the project. Patients also receive education and an educational pamphlet which provided resources related to project interventions. The PHQ-9 score obtained from participants when they initially were identified as scoring positive for depression symptomology, was considered the PHQ-9 baseline score. Demographic data using a standardized form created by the project leader will also be obtained. Demographics collected included participants' age, race and ethnicity, gender, and if they were either international or domestic students.

Treatment for both less severe depression and more severe depression severity categories included a combination of some or all of the following: digital CBT, referral to counseling services, lifestyle modifications, and/or pharmacotherapy if indicated. The intervention for each patient case was determined through a shared decision-making process between the provider and patient. This collaborative process allowed providers and patients to reach a shared decision on treatment options appropriate to the patient's clinical needs while considering patient preferences (NICE, 2022).

Digital CBT was provided through use of the TAO by UpLift © application, formerly known as TAO Connect, Inc.©. TAO by UpLift© is a digital platform of tools and educational materials that aid in improvement of mental health, wellness, and life functioning (Therapy Assistance Online, 2019). It is accessible via home computer, tablet, or smartphone. TAO by UpLift © is free of charge for the university campus and clinic setting in which the EBP project took place. The platform includes various modules focused on mental health and modules specifically focused on CBT for depression. The long course specifically focused on CBT for depression consists of 14 modules. For purposes of this EBP project, a group titled "CBT Evidence-Based Practice Module" was created with the assistance of a TAO Connect, Inc.© product and client success manager. The "CBT Evidence-Based Practice Module" group included the 14 CBT for depression modules included within the digital platform (Therapy Assistance Online, 2019), and module completion was monitored by the project leader. Participants that were referred by the

provider to utilize TAO by UpLift © as an intervention were instructed on how to register and navigate the application. The participants were also instructed to complete at least one module from the CBT for depression module set, each week within the intervention implementation timeframe.

Lifestyle modifications and education about these interventions in relation to depression were also an integral component of the EBP project intervention. An informational brochure and handouts created by the project leader provided more detailed information regarding recommended lifestyle recommendations (Malhi et al., 2021; NICE, 2022). A dietary recommendation handout, created in collaboration with a registered dietician, was utilized in conjunction with verbal education and provided to participants. Recommendations from Malhi et al. (2021), were adapted and summarized for creation of dietary educational material. Campus resource information related to lifestyle modifications were also included in the participant education and educational pamphlet. The documents included as educational material described healthy eating options, exercise recommendations and available campus resources, sleep hygiene recommendations, and the importance of decreasing tobacco and alcohol consumption (Malhi et al., 2021; NICE, 2022). Referrals to the campus counseling center, clinic registered dietician, and campus wellness office for well-being consultations were provided if indicated by each participant case.

The providers at the clinic prescribed pharmacotherapy to those that agreed to participate in the project and met criteria for starting medication. A shared decision-making process between the patient and provider was utilized in discussions pertaining to pharmacological treatment. Discussions included if pharmacotherapy was recommended for the specific patient case, reasons for offering medication management, choices of medication, benefits and harms, and any patient concerns regarding taking or stopping prescribed medications (NICE, 2022). For patients that are in the less severe depression severity category (PHQ-9 score of less than 16), pharmacotherapy is typically not recommended. However, if the provider sees an indication for

medication based on clinical judgment and the specific patient case, an SSRI is recommended (NICE, 2022). For participants in the more severe depression severity category (PHQ-9 score of 16 or greater), either an SSRI or SNRI are recommended (NICE, 2022). Participants were advised to take the medication as prescribed if pharmacotherapy was indicated. Education was provided by the providers and project leader describing the medication's mechanism of action, side effects, and dosage. Those with concerns regarding the medication or who wished to discontinue the medication were instructed to contact the provider. Follow-up appointments for those participants initiated on an antidepressant medication were made for four weeks after initiation of the medication (NICE, 2022). It was anticipated that some participants would not be indicated for pharmacotherapy use or may refuse pharmacotherapy, and if so, they were still able to participate in the EBP project as they could still benefit from digital CBT, counseling services, and lifestyle modifications.

Participants were reminded that routine follow-up, either in person or via phone call, would be conducted at two, four, and eight weeks from baseline. The PHQ-9 was re-administered, and the participant was asked to self-report intervention adherence through a log created by the project leader. Participants were also advised that any questions or concerns could also be expressed at any point to the project leader and providers throughout the implementation timeframe.

Comparison

The PHQ-9 score at baseline and at subsequent follow-ups at 2-weeks, 4-weeks, and 8-weeks from baseline were obtained from participants. Mean PHQ-9 scores at baseline and mean PHQ-9 scores at the final 8-week follow-up were compared. Participants served as their own comparison.

The incidence of patients newly identified with depression symptomology was also assessed. The rate of newly identified patients with depression symptoms, identified through the implemented universal depression screening from the time period between September 11, 2023,

to December 1, 2023, was compared to the incidence of newly identified patients with depression without implementation of universal depression screening from the previous year during the same timeframe, between September 11, 2022, to December 1, 2022.

Outcomes

In this EBP project, the PHQ-2 was utilized as an initial screening tool for all patients, and if a score of 3 or greater was found this initiated administration of the PHQ-9 screening tool. When utilizing a score of 3 or greater on the PHQ-2, the questionnaire has been shown to have a sensitivity of 83% and a specificity of 92% for major depression (Kroenke et al., 2003). The PHQ-9 will be utilized for further screening and determination of severity of depression. A PHQ-9 score of 10 or greater has been found to have a sensitivity of 88% and a specificity of 88% for major depression (Kroenke et al., 2001).

One of the primary outcomes of the EBP project was to compare mean baseline PHQ-9 scores to the final 8-week follow-up PHQ-9 scores through use of a paired *t* test. To assess the efficacy of the interventions, the PHQ-9 score obtained from participants when they initially were identified as scoring positive for depression symptomology, was considered the PHQ-9 baseline score. The project leader collected participant PHQ-9 scores at two, four, and eight weeks from baseline. The purpose of collecting PHQ-9 scores in intervals was for comparison of data from baseline through the course of the intervention implementation, and to address adherence to management interventions with participants.

An additional primary outcome included the use of Fisher's exact test. Fisher's exact test was utilized to analyze the proportion of newly identified patients with depression symptomology before and after implementation of universal depression screening. Analysis focused on newly identified patients with use of an implemented universal depression screening during the recruitment time period of this EBP project, and a comparison with the proportion of newly identified patients with a diagnosis of depression without implementation of universal depression screening from the previous year during the same timeframe.

Secondary outcomes include use of the paired *t* test, Wilcoxon Signed Rank test, and McNemar's test to determine if characteristics that were inquired upon for each participant's self-reporting of intervention strategy adherence, demonstrated evidence of statistical difference from baseline to final follow-up at 8 weeks.

Time

The project leader implemented the project in the Fall of 2023. The outcomes for the project were originally to be evaluated over a 12-week intervention period. Due to low recruitment of participants in the beginning of project implementation, it was determined that the recruitment time would be extended to December 2023. Due to the extended recruitment period, the 12-week follow-up timeframe was shortened to 8 weeks to allow for an adequate timeframe to complete data analysis. Due to these changes, the EBP project had a rolling recruitment of participants which occurred between September 11, 2023, and December 1, 2023. Because participants had varying start times, data collection of follow-up PHQ-9 scores continued into the third week of January 2024. The implementation timeline of this project is outlined in Appendix D.

Protection of Human Subjects

Human subjects were protected throughout the duration of the project. An online training course regarding protection of human subjects was completed by the project leader on March 30, 2023, through the Collaborative Institutional Training Initiative (CITI). Because this is an evidence-based project and the project leader was not producing original research, this EBP project was determined to be exempt from Institutional Review Board (IRB) oversight through the Valparaiso University IRB.

Consent was obtained from all participants after reviewing the purpose of the project, risks, benefits, confidentiality, and voluntary participation. Each participant was given a code number. All data collected for the duration of the project was kept secured via a password protected computer. At each follow-up interval, the project leader contacted participants via phone call or were seen in-person during clinic follow-up appointments, to obtain PHQ-9 scores

and reinforce and follow-up on intervention adherence. An Excel spreadsheet was created to document the scores and track intervention adherence to track each patient's progression. The code sheet, along with documents containing personal information, were destroyed upon completion of the project.

CHAPTER 4

FINDINGS

The purpose of this project was to increase early identification of depression through implementation of universal depression screening, and to implement management strategies to decrease symptoms of depression. A comprehensive literature search yielded 17 pieces of evidence supporting best practice implementation of a two-tiered approach to universal depression screening and the use of management interventions for depression. Management interventions could include some or all of the following: lifestyle modification strategies, referral to counseling services, use of dCBT, and/or pharmacotherapy if indicated.

Two primary outcomes were assessed for this project. The first primary outcome consisted of comparing participant mean pre- and post-intervention PHQ-9 scores through use of a paired *t* test. An additional primary outcome consisted of comparison between the proportion of newly identified patients with depression symptomology before and after implementation of universal depression screening through use of the Fisher's exact test. A secondary outcome included use of the paired *t* test, Wilcoxon Signed Rank test, and McNemar's test to compare pre- and post-intervention characteristics inquired upon for each participant's self-reporting of intervention strategy adherence or use.

Participants

During the implementation of the universal depression screening, 25 students screened positive on the PHQ-2 and PHQ-9 and were determined to be newly identified with depression symptomology. Of the 25 patients who screened positive for depression symptomology, the mean age was 21.4 years (SD=3.24). Regarding the biological sex defined at birth for all patients that screened positive, there were 13 (52.0%) females and 12 (48.0%) males. Regarding university grade level, there were 7 freshman students (28.0%), 3 sophomore students (12.0%), 4 junior students (16.0%), and 8 graduate-level students (44%). In addition,14 patients (56.0%)

were international students, and 11 patients (44.0%) were domestic students. The incidence of race/ethnicity for all 25 patients could not be determined, as this information could not be determined from the EMR system, AdvancedMD, for the 15 students that did not accept further evaluation, management, and participation in this EBP project.

Of the 25 patients who screened positive for depression symptoms, 10 patients accepted further evaluation, management, and participation in the project. The 10 participants were young adults, with ages ranging from 18 to 25 years of age, with a mean age of 20.5 years (SD = 3.06). The majority of participants identified as female (50.0%), and the race/ethnicity that was most prevalent were participants that identified as Asian (60.0%). In addition, most participants in the project identified their university grade level as freshman (50.0%). Further demographic data for the 10 participants who participated in the project can be found in Table 4.1.

Management strategies were determined for each participant in a shared decision-making process between each individual participant and their provider. Lifestyle modification and associated strategies, dCBT education and registration, referral to counseling services, and education and referral to use of the campus fitness center were provided to all participants (100%). Sixty percent of participants were referred to the campus wellness office, 60% of participants were referred to the student health center dietician, and 60% of patients had pharmacotherapy as a component of their management interventions. Providers involved in the project included two family nurse practitioners, one physician, one medical assistant, and one clerical staff.

Table 4.1

Participant Demographic Data

Demographic	Participants n=10
Age [mean (SD)]	20.50 (3.06)
Gender, n (%)	
Female	5 (50.0)
Male	4 (40.0)
Gender Variant/Non-conforming	1 (10.0)
Race/Ethnicity, n (%)	
Asian	6 (60.0)
Caucasian or White	3 (30.0)
Hispanic, Latino, or Spanish Origin	1 (10.0)
University Grade Level, n (%)	
Freshman	5 (50.0)
Sophomore	1 (10.0)
Junior	1 (10.0)
Graduate-Level	3 (30.0)
Student, n (%)	
International Student	5 (50.0)
Domestic Student	5 (50.0)

Changes in Outcomes

The PICOT question for this project was: in adults, over the age of 18, does implementation of universal depression screening, compared to no universal depression screening, improve the identification of patients with depression symptomology; and for those who screen positive for depression symptomology, does follow-up for further evaluation and management interventions as decided upon in a shared decision-making model between the patient and provider that can include some or all of the following: lifestyle modification and

associated referrals, referral to counseling services, use of digital cognitive behavioral therapy, and/or pharmacotherapy if indicated improve patient's PHQ-9 scores over an 8-week period in a university student health center setting? Primary outcomes were analyzed through use of the paired *t* test and Fisher's exact test. The secondary outcome was analyzed through use of the paired *t* test, Wilcoxon Signed Rank test, and McNemar's test.

Statistical Testing and Significance

For data entry and statistical analysis, the project leader was assisted by statistician, Gregory E. Gilbert, EdD, MSPH, PStat(r). The statistical software known as *R,* was utilized for analysis. One evaluation of primary outcome included the use of the paired *t* test. A paired sample *t* test was an appropriate analysis due to its use to assess the difference in mean scores, interval or ratio data, between two related samples (Cronk, 2020). For this EBP project the difference in post-intervention and pre-intervention PHQ-9 scores was tested using the Anderson-Darling, Shapiro-Francia, Shapiro-Wilk tests and a normal probability (Q-Q) plot (Anderson & Darling, 1954; Shapiro & Francia, 1972; Shapiro & Wilk, 1965). All three tests concurred leading to the assumption of normality to fail to be rejected (Anderson-Darling: A=0.375; *p*=0.341, Shapiro-Francia, W=0.951, *p*=0.397; and Shapiro-Wilk: W=0.905, *p*=0.250). Due to the data being normally distributed, the paired *t* test was utilized to compare participant pre- and post-intervention mean PHQ-9 scores. Visual representations of participant total PHQ-9 scores and mean PHQ-9 scores during baseline and at each follow-up interval are outlined in Appendix E and Appendix F. An additional primary outcome that was evaluated utilized the Fisher's exact test, a nonparametric test for categorical data, to compare the proportion of depression symptomology before and after implementation of universal depression screening.

Analysis of the Instrument

Internal consistency of the PHQ-9 depression screening tool was measured pre-intervention and post-intervention using coefficient α, Guttman's λ_6, and McDonald's ω. The reason for utilizing these three measures is that there are concerns regarding the reliability of

only reporting coefficient α; however, here it is reported for comparison with the existing literature. Results for the pre-intervention PHQ-9 were mixed. In the pre-intervention period, coefficient α was 0.63, Guttman's λ_6 was 0.99, and McDonald's ω was 0.83. For the pre-intervention, the minimal criterion for good internal consistency for coefficient α was achieved (Bagozzi & Youjae, 1988; George & Mallery, 2007). Coefficient α Guttman's λ_6, and McDonald's ω did not agree suggesting "lumpiness", or that the data are composed of subfactors. The low coefficient α suggests one or more of the factors may not be representative of the domain being measured, which is depression during the pre-intervention. The agreement between λ_6 and ω suggest item loadings are not equal and each item in the PHQ-9 does not contribute equally to the factor (depression; tau-equivalence does not exist).

Psychometric results in the post-intervention differed from results in the pre-intervention. Coefficient α was 0.94, Guttman's λ_6 was 0.96, and McDonald's ω was 0.98. This can be interpreted, overall, as good to excellent (0.8 to 0.9) (Bagozzi & Youjae, 1988; George & Mallery, 2007). Coefficient α and λ_6 generally agree, suggesting the factors are unidimensional in nature and are not composed of subfactors unlike during the pre-intervention. The general equality seen between α and λ_6 also suggest item loadings within the PHQ-9 are equal, and each item contributes equally to the factor (depression; tau-equivalence exists). Both estimates are similar enough to ω to suggest the items composing the factors are homogenous.

Findings

Primary Outcomes

Mean PHQ-9 Scores From Baseline to Eight Weeks. The primary outcome of pre- and post-intervention PHQ-9 scores was evaluated with a paired *t* test. The mean pre-intervention and post-intervention PHQ-9 scores were 16.50 (SD=3.44) and 6.50 (SD=5.93), respectively. Mean PHQ-9 scores decreased by 10.00 points in participants that utilized best practice management interventions for depression during the 8-week intervention. The reduction in mean

PHQ-9 scores was statistically significant ($t(9) = 8.90$, $p < 0.001$) (see Table 4.2 and Table 4.3). The Common Language Effect size was 0.93 or 93%. This can be interpreted as if one were to have randomly selected participants in the post-intervention, 93% of them would have lower PHQ-9 scores than they had in the pre-intervention.

Table 4.2

Participant PHQ-9 Scores

Participant	Pre-intervention (Baseline)	Post-intervention (8-weeks)
1	14	12
2	19	0
3	12	12
4	13	5
5	13	4
6	15	6
7	20	1
8	20	7
9	21	0
10	18	18

Table 4.3

Paired t tests Comparing Baseline PHQ-9 Score to 8-week PHQ-9 Score

		Mean (SD)	*t*	*df*	*p*
Paired PHQ-9			8.90	9	<0.001
	Pre-Intervention	16.50 (3.44)			
	Post-Intervention	6.50 (5.93)			

Newly Identified Depression Symptomology with use of Universal Depression Screening. Fisher's exact test was also utilized to analyze the proportion of newly identified patients with depression symptomology before and after implementation of universal depression screening. The comparison time periods include the timeframe of this EBP project's universal depression screening implementation (September 11, 2023, to December 1, 2023), compared to the same timeframe the previous year without a universal depression screening intervention (September 11, 2022, to December 1, 2022) (see Table 4.4). There was statistical evidence of a difference between the two periods of time ($\chi^2_{(1)}$=16.53, p<0.001). The relative risk was found to be 2.5, meaning that patients within the implementation period ran 2.5 times the risk of depression symptoms being detected as patients before implementation (see Table 4.5).

Table 4.4

Newly Identified Patients with Depression Symptomology (Patient Totals)

	No Universal Depression Screening (2022[a])	Universal Depression Screening Implementation (2023[a])
Number of Newly Identified Patients with Depression symptomology	8	25
Total Patients seen in Clinic	779	539
Percent (%)	1.03%	4.64%

Note. [a]September 11 to December 1

Table 4.5

Newly Identified Patients with Depression Symptomology

Depression Symptomology			
2022[a]	2023[a]	*p*	RR
1.03%	4.64%	<0.001	2.5

Note. Abbreviations: RR=Relative risk
[a]September 11 to December 1

Secondary Outcome

Intervention Strategy Adherence or Use at Baseline and Eight Weeks. Participants were asked to self-report depression management strategy use at baseline and at 2, 4, and 8 weeks from baseline. Characteristics that were inquired upon included exercise per week, exercise per hour, dCBT use, smoking status, alcohol intake, hours of sleep, caffeine intake, diet, pharmacotherapy, use of counseling services, use of wellness office services, use of dietician services, and use of campus fitness facilities. The paired *t*-test, Wilcoxon Signed Rank test, and McNemar's test were utilized to determine if any of the characteristics demonstrated evidence of statistical difference from baseline to final follow-up at 8 weeks. Only six characteristics demonstrated evidence of statistical difference: diet where it appears that participants improved dietary habits [$\chi^2_{(5)}$=10.87; p=0.054], improvement in nighttime sleeping hours [V=21; p=0.025] , demonstration that participants were prescribed anti-depressant medications ($\chi^2_{(1)}$=4.55; p=0.033) , anti-depressant medications where students were taking medications as prescribed ($\chi^2_{(5)}$=13.52; p=0.019), patients were making more counseling appointments ($\chi^2_{(1)}$=4.55; p=0.033), and there was more use of campus fitness facilities ($\chi^2_{(1)}$=15.14; p<0.001) (see Table 4.6).

Table 4.6

Intervention Strategy Use - Baseline and 8-weeks

Management Strategies		Week		
		Baseline	8	*p*
Physical Activity Performed (%)	Yes	8 (80.0)	10 (100.0)	0.474[a]
	No	2 (20.0)	0 (0.0)	
Times per week of Exercise (%)	0 times	2 (20.0)	0 (0.0)	0.691[a]
	1 time	1 (10.0)	0 (0.0)	
	2-3 times	4 (40.0)	6 (60.0)	
	3-5 times	2 (20.0)	3 (30.0)	
	Greater than times per week	1 (10.0)	1 (10.0)	
Minutes of Exercise (%)	20 minutes or less	4 (40.0)	0 (0.0)	0.212[a]
	30-45 minutes	3 (30.0)	6 (60.0)	
	46-60 minutes	2 (20.0)	2 (20.0)	
	Greater than 60 minutes	1 (10.0)	2 (20.0)	
Days per week of Balanced Diet (%)	0 days	1 (10.0)	0 (0.0)	0.054[a]
	1 day	0 (0.0)	1 (10.0)	
	2-3 days	9 (90.0)	5 (50.0)	
	4-5 days	0 (0.0)	4 (40.0)	
Hours of Sleep [median (IQR)]		5.5 (5.0 – 6.0)	7.0 (6.0 – 7.0)	0.026[c]
Caffeine Intake per week [mean (SD)]		3.60 (4.79)	1.20 (1.62)	0.151[b]
Smoke (%)	No	10 (100.0)	10 (100.0)	
Alcohol Consumption per Day [mean (SD)]		0.30 (0.48)	0.10 (0.32)	0.288[b]
Alcohol Consumption per Week [median (IQR)]		0 (0.0 – 0.075	0 (0.0 – 0.0)	0.303[c]

Anti-depressant Medication (%)	Yes	0 (0.0)	5 (50.0)	0.033[a]
	No	10 (100.0)	5 (50.0)	
Medication Type (%)	Bupropion (Wellbutrin)	0 (0.0)	1 (14.3)	0.375[a]
	Escitalopram (Lexapro)	0 (0.0)	2 (28.6)	
	Sertraline (Zoloft)	0 (0.0)	3 (42.9)	
	Patient refused medication	0 (0.0)	1 (14.3)	
	Not Applicable	1 (100.0)	0 (0.0)	
Pharmacotherapy Adherence (%)	Yes	0 (0.0)	5 (50.0)	0.019[a]
	No	0 (0.0)	1 (10.0)	
	Not applicable	10 (100.0)	4 (40.0)	
dCBT use (%)	Yes	1 (10.0)	2 (20.0)	1.000[a]
	No	9 (90.0)	8 (80.0)	
Counseling appointment (%)	Yes	0 (0.0)	5 (50.0)	0.033[a]
	No	10 (100.0)	5 (50.0)	
Wellness Office appointment (%)	Yes	0 (0.0)	1 (10.0)	1.000[a]
	No	10 (100.0)	9 (90.0)	
Use of Fitness Facilities (%)	Yes	1 (10.0)	9 (90.0)	<0.001[a]
	No	9 (90.0)	1 (10.0)	
Use of Dietician services (%)	No	10 (100.0)	10 (100.0)	---

Note. Abbreviations: SD=standard deviation;
[a]McNemar's test
[b]Paired *t* test
[c]Wilcoxon Signed Rank test

CHAPTER 5

DISCUSSION

The following PICOT question was used for this EBP: in adults, over the age of 18, does implementation of universal depression screening, compared to no universal depression screening improve the identification of patients with depression symptomology; and for those who screen positive for depression symptomology, does follow-up for further evaluation and management interventions as decided upon in a shared decision-making model between the patient and provider that can include some or all of the following: lifestyle modification and associated referrals, referral to counseling services, use of digital cognitive behavioral therapy, and/or pharmacotherapy if indicated improve patient's PHQ-9 scores over an 8-week period in a university student health center setting? A comprehensive literature search yielded evidence supporting best practice implementation of a two-tiered approach to universal depression screening, and the use of management interventions for depression symptomology.

This chapter provides a comprehensive explanation and discussion of the findings of this EBP project. Strengths, limitations, and sustainability of the project will also be addressed. Furthermore, the relevance of the EBP model that was selected to guide the planning, implementation, and dissemination phases of this project will be evaluated. Recommendations for the future regarding research and education of depression screening and depression management interventions will also be explored.

Explanation of Findings

Demographic Findings

Demographics. During implementation of universal depression screening, a total of 25 students screened positive on the PHQ-2 and subsequent PHQ-9 depression screening tools. These patients were also determined to be newly identified with depression symptomology. Of the 25 patients who screened positive for depression, 10 patients accepted further evaluation,

management, and participation in this EBP project. Females made up the majority of the newly identified patients with depression symptomology (52.0%), and of the 10 patients that participated in the project, the majority identified as female (50.0%) as well. This finding is consistent with evidence found in the literature. Evidence notes that women have twice the risk of depression compared to men (Malhi et al., 2020; Malhi et al., 2021; USPSTF, 2023; Yates et al., 2020). The mean age of the 10 participants within this EBP project was 20.5 years (SD=3.06), with ages ranging from 18 to 25 years of age. This finding is consistent with evidence found in the literature as it is noted that the average age of onset of depression is within adolescence to early adulthood (Malhi et al., 2020; Malhi et al., 2021; USPSTF, 2023). The average age of onset of depression has also been found to be within an individual's mid-20s (Malhi et al., 2020; Malhi et al., 2021)

Of the 25 patients who screened positive for depression through use of a two-tiered universal depression screening approach, 14 patients (56.0%) were noted be international students. Of the 10 participants who participated in further evaluation and management of depression within this project, 5 participants (50.0%) identified as international students. Slabaugh et al. (2019) failed to include gender and race in data collection; however clinical staff in this study noted an anecdotal increase of international students seeking mental health related services. Due to this observation, determining methods in which how to best provide care for international students who may have concerns and stressors that differ from domestic students within the United States is of specific interest (Slabaugh et al., 2019).

It was also important to note the university level of participants within the project. Of the 10 participants, 50% identified as freshman students and 30% identified as graduate-level students. These two university levels are to be noted, as they represent periods of transition and change regarding educational and associated personal endeavors. Evidence demonstrates that depression is a prominent barrier to student learning, success, wellness, and retention and due to this reason appropriate management and screening strategies must be implemented to ensure

appropriate early diagnosis and intervention (Bever & Maks, 2023). Within the 10 participants in the project, the race/ethnicity that was found to be most prevalent were participants who identified as Asian (60.0%). It is noted in the evidence that prevalence rates of depression can vary regarding race/ethnicity; however, multiracial individuals, and Native American/Alaska Native individuals have been found to have higher rates of depression (Malhi et al., 2020; Malhi et al., 2021; USPSTF, 2023). Due to these variances, it is crucial to ensure that all patients are screened for depression as it is a condition that affects all individuals regardless of gender, age, race/ethnicity, education level, geographic location, or socioeconomic status. It is instead imperative to focus on risk factors for depression that can include a combination of genetic, biological, and environmental factors (Malhi et al., 2020; Malhi et al., 2021; USPSTF, 2023).

Primary Outcomes

Mean PHQ-9 Scores From Baseline to Eight Weeks. A paired *t* test was utilized to compare participant pre- and post-intervention mean PHQ-9 scores. The reduction in mean PHQ-9 scores was found to be statistically significant ($t(9) = 8.90$, $p < 0.001$). This demonstrates that there was an overall significant decrease in PHQ-9 scores after implementation of depression management interventions that included some or all the following based on a shared decision-making model: lifestyle modification and associated referrals, referral to counseling services, use of dCBT, and/or pharmacotherapy if indicated (APA, 2019; Malhi et al., 2021; Malhi et al., 2020; NICE, 2022; Qaseem et al., 2023; USPSTF, 2023; Yates et al., 2020). Clinical significance was also found through use of the Common Language Effect size, which was 0.93 or 93%. This can be interpreted as if one were to have randomly selected participants in the post-intervention, 93% of them would have lower PHQ-9 scores than they had in the pre-intervention.

The mean baseline PHQ-9 score of 10 participants was 16.50. This score is considered to demonstrate moderately severe depression (Kroenke et al., 2001). Following NICE (2022) clinical guideline recommendations, PHQ-9 scores of 16 or greater are indicated as more severe

depression. Within this EBP project, all 10 participants were newly identified with depression symptomology and had not initiated any interventions prior to baseline PHQ-9 score screening. After screening positive for depression and undergoing appropriate follow-up evaluation, 6 out of the 10 participants were educated and prescribed an anti-depressant medication as part of their management strategy plan. Of these 6 patients, 5 patients (50%) were noted to adhere to their specific pharmacotherapy intervention. Evidence demonstrates that the benefits of anti-depressant pharmacotherapy alone are typically seen within at least four weeks, and follow-up evaluation of the management plan should be conducted at that time (NICE, 2022). In addition, evidence suggests that reduction in depressive symptoms may be observed at a minimum of four to six weeks after utilizing one or more of the following depression management strategies that can include lifestyle strategies that include modifications in nutrition and physical activity, psychological interventions, and anti-depressant pharmacotherapy if indicated by the patient case (APA, 2019; Malhi et al., 2021; Malhi et al., 2020; NICE, 2022; Yates et al., 2020). Due to this evidence, it is likely that a combination of various evidence-based management strategies utilized in this EBP project, and not solely pharmacotherapy, played a role in reduction of the overall mean PHQ-9 score. Following the 8-week intervention within this EBP project, the mean PHQ-9 score for the 10 participants was 6.50. This average score is considered mild in regard to depression severity (Kroenke et al., 2001). Following NICE (2022) clinical guideline recommendations, PHQ-9 scores that are less than 16 are indicated as less severe depression.

Participants were encouraged to continue their specific management interventions after the 8-week period of data collection had concluded, especially for those that continued to have an elevated PHQ-9 score. The findings from this EBP project suggest that the use of more than one management intervention, decided upon in a shared decision-making process between the provider and patient, plays a role in managing depression symptomology and therefore decreasing PHQ-9 scores. The use of a combination of interventions to manage depression

symptomology is supported through evidence and clinical practice (APA, 2019; Malhi et al., 2021; Malhi et al., 2020; NICE, 2022; Qaseem et al., 2023; USPSTF, 2023; Yates et al., 2020).

Newly Identified Depression Symptomology with use of Universal Depression Screening. Fisher's exact test was also utilized to analyze the proportion of newly identified patients with depression symptomology before and after implementation of universal depression screening. There was statistical evidence of a difference between the two periods of time ($\chi^2_{(1)}$=16.53, p<0.001). The relative risk was found to be 2.5, meaning that patients within the implementation period ran 2.5 times the risk of depression symptoms being detected as patients before implementation of universal depression screening. In effect, the intervention made patients more likely to have depression symptoms detected.

Bever & Maks (2023), note that through implementation of a two-tiered universal depression screening, results suggested that this protocol was successful with increasing depression screening due to a screening increase from an assumed 0% to 98.03%. Findings during this time frame also suggested that their protocol was successful in increasing depression management due to findings of appropriate referrals having increased from an assumed 0% to 93.33% (Bever & Maks, 2023). The increase in both screening and appropriate referrals due to increased depression screening, demonstrate that universal depression screening protocols have the potential to identify new cases of depression symptomology and in doing so can aid in early detection and prevention of worsening symptoms of depression (Bever & Makes, 2023; Slabaugh et al., 2018).

Secondary Outcome

Intervention Strategy Adherence or Use at Baseline and Eight Weeks. Participants were asked to self-report depression management strategy use at baseline and at 2, 4, and 8 weeks from baseline. Only six characteristics demonstrated evidence of statistical difference: diet where it appears that participants improved dietary habits [$\chi^2_{(5)}$=10.87; p=0.054], improvement in

nighttime sleeping hours [V=21; p=0.025] , demonstration that participants prescribed anti-depressant medications ($\chi^2_{(1)}$=4.55; p=0.033) , anti-depressant medications where students were taking medications as prescribed ($\chi^2_{(5)}$=13.52; p=0.019), patients were making more counseling appointments ($\chi^2_{(1)}$=4.55; p=0.033), and there was more use of campus fitness facilities ($\chi^2_{(1)}$=15.14; p<0.001).

Characteristics that were found to not demonstrate evidence of statistical difference include the following: times per week of exercise and minutes of exercise, caffeine intake per week, alcohol consumption, dCBT use, use of wellness office appointments, and use of registered dietician services. Use of dCBT was a characteristic that did not demonstrate evidence of statistical difference regarding adherence or usage, and this was not consistent with evidence when relating to its impact on depression symptomology. In McDermott & Dozois (2019), participants in a dCBT condition demonstrated more continuous depressive symptom improvement between baseline and follow-up at four months. In regard to follow-up, a dCBT group improved in depressive symptomology in comparison to an attentional bias modification program to a greater extent over a 4-month period of time, F(1,688) = 11.95, p <.001 (McDermott & Dozois, 2019).

Evidence notes that depression management interventions typically take, at a minimum, 4 to 6 weeks to note a benefit that is demonstrated through reduction of depression symptomology (APA, 2019; Malhi et al., 2021; Malhi et al., 2020; NICE, 2022; Yates et al., 2020). Due to the shortened time frame of 8-weeks of the EBP project's implementation of management strategies, it is possible that participants did not have enough time to equally and consistently adhere to all management strategies and making them a part of their daily or weekly routine. Comparison was also only evaluated between baseline and at 8-weeks from baseline which also does not account for the weeks in between the intervention period where some patients did note usage of resources such as dCBT, wellness office appointments, or use of dietitian services.

Also, due to use of a shared decision-making model between the provider and patient, some patients were not referred to use of the wellness office campus resource nor registered dietician if it was not indicated for their specific patient case. It is possible that if the data collection were to be extended to demonstrate usage of strategies across an entire academic year, it would provide more time for patients to take familiarize themselves with dCBT resources and have more opportunities to make appointments to campus resources which are associated with depression management strategies.

Additional Literature Search

An additional extensive literature search was completed after data analysis to identify potential new findings in the literature. Similar search criteria described in chapter 2 were utilized to conduct the additional literature search. Two articles were found that had been published since the original literature search. Sadeghi et al. (2023), conducted a cross-sectional study which focused on determining the role of social support and socioeconomic factors in predicting depression among first-year undergraduate students in a university in Iran. A perceived social support questionnaire was utilized to assess social support utilizing twelve questions from three essential sources of family, friends, and others. Beck's depression questionnaire was utilized to determine a depression level or score for participants. Results of this study demonstrated a significant difference between depression screening scores of male and female students, where female students were noted to have higher depression scores (Sadeghi et al., 2023). Findings also demonstrated that the level of social support and depression were significantly different among students of different majors. Depression scores of laboratory science students were lower than seven other majors identified (nursing, midwifery, surgical technology, anesthesia, radiologic technology, environmental health, and public health majors), and environmental science and public health students exhibited much higher depression scores than other majors identified (Sadeghi et al., 2023). From an academic perspective, the study also demonstrated that the level of depression was strongly correlated with the level of perceived social support by

undergraduate students (Sadeghi et al., 2023). Noting the existence of inverse and significant correlation between depression and social support; it was identified that any intervention to promote the social support of first-year undergraduate students can play a role in decreasing depression symptomology (Sadeghi et al., 2023).

A study by Hwang et al. (2023) was also found in the additional literature search. The study focused on the effectiveness of a motivational interviewing-existential psychotherapy group counseling program for Korean college students that exhibited depression symptomology. The program consisted of 8 sessions over a period of 4 weeks (Hwang et al., 2023). Existential psychotherapy aids participants in understanding depression in a more theoretical manner. In Existential Psychotherapy, depression is thought to come from existential emptiness and frustration due to the absence of meaning in life. The core themes of this method include the themes of relationship with others, freedom of choice, limits, and purpose and meaning of life (Hwang et al., 2023). The concept of motivational interviewing was also utilized. Motivational interviewing is counseling that focuses on a patient internal process for moving forward with the motivation for change, and places importance on the patient's needs (Hwang et al., 2023). This study utilized the Beck Depression Inventory-II to measure depression scores, and the Steger's Meaning in Life Questionnaire was utilized to measure participant's meaning of life. Data analysis of this study demonstrated a significant decrease in depression of participants who took part in the counseling program and maintained this change for an additional month after the program concluded (Hwang et al., 2023). This study demonstrated the potential of this motivational interviewing and social support model as a time-efficient and cost-effective method for use in university healthcare settings, specifically in university counseling centers.

Strengths and Limitations of the DNP Project

Strengths

There were several different strengths throughout the EBP project development and implementation. One of the primary strengths of this project was the opportunity to provide

mental health services in a non-psychiatric setting. This project allowed an opportunity to further connect patients and participants to not only the student health center; but also, to campus resources such as fitness facilities, campus wellness office services, campus counseling center, use of the university provided TAO by UpLift © application, and student health center registered dietician services. Having campus resources available in close proximity to the student health center also allowed for further connection to participants and associated management strategies. This was specifically demonstrated after initial evaluation of one of the participants during the implementation phase of the project. After the follow-up evaluation of the participant, one of the NP providers and the project leader had to make immediate referral and transport to counseling services on campus due to the patient's mention of a plan of self-harm in the past and possible future. Having the ability to make an immediate referral and appointment on the same day at campus counseling services allowed for assurance that the participant would begin following management strategies right away and that providers would be able to evaluate the best plan that was appropriate for the patient, in conjunction with collaboration and expertise of counseling services.

In addition, the education provided to patients that screened positive for depression symptomology, was also crucial in providing simple to understand resources that emphasized lifestyle modifications and use of psychological intervention resources readily available on campus to all students. It is the hope that this knowledge will translate to a lifelong impact of participants being empowered to practice positive depression management strategies not only during their time as university students, but also throughout their lives. This project also demonstrated that there are a variety of interventions that should be considered to manage depression symptoms in a student health primary care setting. The interventions are cost-effective, simple to utilize, and evidence supports their safety. It is crucial to continue making strides toward decreasing the stigma of depression. and making these conversations between providers and patients more commonplace.

Another notable strength of this project was the project leader's use of periodic follow-up calls to aid in improving communication with participants and providing reminders on adherence to depression management interventions. Consistent follow-up served as a method in which to prevent participants from leaving the project due to factors such as loss of motivation or other unforeseeable circumstances. In addition, follow-up phone calls allowed for an opportunity for the project leader to address concerns or questions. Such consistent communication with participants and noting their needs and progress aided in fostering a sense of accountability and motivation for the participants throughout the project implementation phase.

Lastly, the use of a two-tiered approach for universal depression screening was a strength to consider. The use of PHQ-2 as an initial screening tool allowed for a simple distribution and administration of the tool to many patients. Providing a streamlined method of universal screening was imperative, as the student health center does not have a large clinical staff. The current staff includes two nurse practitioners, one physician, one medical assistant and one front desk clerical staff. Having a simple, straightforward process was imperative as to not disrupt the daily workflow of the clinic environment.

Limitations

Throughout the course of the project, there were some limitations and barriers encountered. One of the limitations pertained to the student health center's EMR system. The current system does not have the capability to provide an alert or reminder to indicate to clinic staff and providers that a depression screening is indicated for each patient, or that a positive PHQ-2 and PHQ-9 score was achieved. Due to this reason, throughout the project, the clinic receptionist played a role in ensuring that PHQ-2 and PHQ-9 forms were included in digital intake forms and distributed as per project protocol. The medical assistant and providers also served as a method to ensure that positive scores were not missed as they reviewed the patient's chart. For this reason, clinic staff and providers were educated before the beginning of

the project and during project implementation to review the EBP project process workflow and the protocol for universal depression screening.

Another barrier that was encountered during project implementation was that the project had to change from having a strict multimodal intervention consisting only of lifestyle modifications, use of dCBT, and pharmacotherapy if indicated by the patient case. With this strict multimodal intervention, it was noted early on that patients were not consistently staying compliant with use of dCBT. Due to this reason, it was imperative for the project leader to return to the evidence and in doing so modify from a strict multimodal intervention to a more shared decision-making model with provision of some or all EBP project management interventions which included: lifestyle modification and associated referrals, referral to counseling services, use of dCBT, and/or pharmacotherapy if indicated. Although this circumstance was perceived as a barrier at first, it became a strength of the project because patients were able to have a management plan that was more patient-centered and that would align with not only the provider's recommendations but would also take the patient and their lifestyle into account.

Another limitation was the timeframe of the EBP project. Due to university breaks and holidays during the fall semester, there was a need for accommodations and flexibility that needed to be considered when scheduling follow-up calls with participants. Due to holiday breaks and the participants' busy student schedules, it at times did take a couple of days to reach the participants for follow-up. Flexibility was required to better accommodate university and individual participant schedules. The management strategy implementation period also had to be adjusted from 12 weeks to a total of 8 weeks, so as to better accommodate more recruitment for the project while allowing for sufficient time for data collection. A shorter timeframe for the intervention may have impacted patients in that they may not have had enough time to consistently incorporate all management strategies in their daily and weekly routines.

During the project implementation process, it was brought to the project leader's attention by clinic staff that it was difficult at times to ensure that clinical staff and providers provided

patients who scored positive for depression symptomology with a reminder and invitation to schedule a follow-up for further evaluation when the project leader was not in clinic. The main reason indicated was due to limited staff and limited time per appointment. Due to this reason, an educational information summary was created that could be given to patients who scored positive on the depression screening tools. This summary and a brief educational brochure were provided to eligible patients, and this served as a reminder and invitation to schedule a follow-up evaluation. This summary also served as a reminder for clinical providers to educate the patient on the depression screening results.

Sustainability

Although there were some barriers during the implementation phase of this EBP project, sustainability of the project can still be achieved. The clinical site facilitators of this project, two nurse practitioners, have already verbalized that they would like to continue this project regarding use of the two-tiered approach to universal depression screening, along with continued use of associated management strategies and associated referrals to campus resources utilized during the project. Due to the involvement of the two nurse practitioners and clinical site staff throughout the project, sustainability should be easily achievable as they are familiar with the process and material utilized.

Before implementation of the project, the PHQ-9 screening tool was already imbedded into the student health center EMR system making it readily available to administer. The PHQ-2 screening tool was easily added into the EMR system during the planning phase of the project. As both depression screening tools are already a component of the student health center digital intake forms due to implementation of this project, there are no additional steps necessary to maintain the use and distribution of these forms moving forward.

Education regarding depression management interventions was also a significant component of this EBP project. The educational pamphlet handout templates, along with campus resource templates were emailed to the nurse practitioner facilitators. The documents included in

the educational material consisted of a dietary recommendation handout, exercise recommendations, education and registration instructions pertaining to dCBT, and information related to associated campus referrals. The educational information summary template, that was created to serve as a reminder to eligible patients to schedule a follow-up evaluation, was also provided to the clinic facilitators for their future use. The use of dCBT in the form of the TAO by UpLift © application was a management strategy that the providers expressed that they also wanted to continue to offer. Administrative control of the specific TAO by UpLift © group made for the EBP project, was transferred over to the clinic facilitators so that they have access to track progress of any future patients that utilize the tool as a management strategy.

Because the student health center's EMR system still does not have the capability to issue an alert to indicate the need to complete the PHQ-9 due to a positive score on the PHQ-2, the clinical receptionist and medical assistant will still need to be educated on screening protocol. The PowerPoint utilized for initial education of the EBP project process was provided to the clinical stakeholders as well, for use in future education sessions for their clinical staff and providers. It was discussed that having an EMR system reminder would be an aspect to consider for future ease of distribution, ease of identification and reminder to provide these screenings to patients who have not yet had a depression screening during the academic year.

During dissemination of results, the two nurse practitioner facilitators and project leader noted the consideration of the need for the role of a social worker within the student health center to fill the role that the project leader had regarding follow-up and ensuring that patients maintained and adhered to depression management strategies. Having a social worker that could ensure that follow-up appointments were kept or re-scheduled if necessary, and having this additional link between the student health center and campus resources would aid in further sustainability of the project. This consideration will further propel conversations of the need for this type of role within the student health center.

To improve outcomes and sustainability considerations for this EBP project, there are some aspects that the project leader would change or recommend to others considering a similar project. It is recommended to provide more resource options to international students who utilize the student health center for their healthcare needs. For many of these students it is the first time living alone and are at a distance from their home country, families, and typical way of life. It is necessary to ensure that these students fully understand the purpose of management strategies, and to ensure that materials such as dCBT have various languages options available to ensure ease of understanding of material presented. The TAO by UpLift © application utilized for this project for example was only available in English and French. It could be a consideration to find alternate applications that have more language options for any participants who would want this option as part of the depression management plan. For any project leaders who are conducting similar EBP projects, it is also highly recommended that the implementation timeframe for depression management strategies be longer than the 8-week time frame presented in this EBP project. If possible, extended time would allow for a greater opportunity for participants to fully incorporate all management interventions and campus resources in their daily and weekly schedules.

Relevance for EBP Model

The revised Iowa Model was chosen to guide the planning, implementation, and sustainability phases of his EBP project. The model was selected due to its use of feedback loops with the multiphase change process (Melnyk & Fineout-Overholt, 2023). This model is utilized due to its ease of use for clinicians in making decisions regarding clinical and administrative practices that affect healthcare outcomes (Melnyk & Fineout-Overholt, 2023). Overall, this model was useful for guiding this EBP project. The linear process aided in moving the project forward and providing guidance for each subsequent step. The first few steps of the model, which include forming a team, assembling literature, and establishing a sufficient research foundation for the project, aided significantly in the planning phase. This linear process

also aided in the creation and necessary adjustments to the EBP project process flowchart found in Appendix C during the planning and implementation phases of the project.

The steps for implementation were also helpful. The pilot change steps were simple to follow and aided the project leader in developing a comprehensive plan. There were various barriers encountered during implementation and it would have been helpful if the revised Iowa Model included additional steps to aid in navigating unanticipated barriers. It was difficult at times to navigate the barriers and to determine the appropriate steps to take. Having a more solidified guide to follow for unexpected barriers would have aided in the process of resolving barriers in a more timely manner. Although having more outlined steps to overcome barriers encountered would have been helpful, given the time constraints for this EBP project, evaluating processes, and collaborating with the project site facilitators aided with resolving barriers encountered.

The practice change recommended within this EBP project has continued at the clinical site, and due to this the final step of the model regarding dissemination was successfully employed. The project leader met with the project site providers, and the meeting timeframe consisted of dissemination of results and the statistical and clinical significance found. Dissemination also allowed a moment in which the project leader could also gain feedback from project site facilitators and clinical staff regarding the EBP project process and how sustainability of the project can continue to be maintained.

Aside from the barriers encountered during the implementation phase, there were no steps that were noted to be inconsistent or not relevant. Overall, the revised Iowa Model is a helpful guide when organizing and implementing an EBP project. The linear design of this model is a significant strength, especially for clinicians who are not familiar with EBP projects and for those implementing change within a small clinical setting. The model encourages a spirit of inquiry by urging providers to question current practice and evaluate needs for change to improve patient outcomes. The revised Iowa Model provides a clear blueprint for APRNs to ask

questions, implement evidence-based practice changes, and improve patient outcomes in a variety of clinical settings.

Recommendations for the Future

This EBP project demonstrates that implementation of universal depression screening is statistically and clinically significant. In addition, implementation of a combination of depression management strategies also demonstrated a statistically significant reduction in mean PHQ-9 scores over 8-weeks. Recommendations for the future should focus on the continued development of strategies to form trusting relationships between providers and patients to create effective depression management plans in a shared decision-making model. It is also imperative to focus on strategies to decrease the negative stigma of mental health conditions, and in doing so ensure that strategies are in place to increase early identification and management of depression for young adults in university settings.

Research

Further research is necessary regarding depression and its identification and management within primary care, and specifically in university student health center settings. This is significant to consider as the time spent at the college or university-level typically also correlates to periods of transition in an individual's life, which can exacerbate daily stressors and feelings of isolation or distress. In addition, as a shortage of psychiatric providers currently exists, primary care providers will continue to encounter patients with depression symptomology in the clinical setting. Evidence-based treatment approaches to managing depression symptoms are therefore essential. Future research should aim in determining the efficiency of new innovative strategies, such as the use of dCBT applications. As the world becomes more technological and digitally based, having evidence-based digital modalities can serve as another tool for providers to utilize. Future research should be done to identify barriers to implementing psychological interventions, such as dCBT and in-person counseling, in young adult patient populations and to evaluate effectiveness in comparison to pharmacological interventions.

Future research should also be done to identify barriers and solutions in implementing depression management strategies for international students in university student heath center settings. For many of these students, a new environment and new stressors can exacerbate feelings of isolation and distress, which can be precursors to depression symptomology. Knowing the best methods in which to reach out to this student population as soon as they arrive on college campuses, and offering preventative and management strategies through student health center interaction can aid in increasing the communication between health center services and patients. This can be beneficial in the maintenance of optimal physical and mental health during their academic careers and beyond.

In the literature, the PHQ-2 and PHQ-9 were commonly utilized for the screening of the young adult and college-aged student patient populations (Bever & Maks, 2023; Löbner et al., 2018; NICE, 2022; Slabaugh et al., 2018; Yates et al., 2020). Although these screening tools are validated for use in this patient population, there is still a need for continued research on further development of depression screening tools that are specific to young adults. Young adult populations, especially those in a college or university settings, often have stressors and concerns that can vary from other young adults or older adults that are not in a college or university setting. Due to this reason, it is imperative to determine if there are additional depression screening tools that can also aid in capturing the unique needs of young adult populations within these settings.

Education

Mental health considerations, and specifically depression, is found in all areas of clinical care. Due to this reason, education on depression identification, prevention, and management should be a continuous process beginning with undergraduate nursing students. In this EBP project, education was integral to its implementation. During the recruitment and implementation phases, a significant amount of time was utilized to educate patients on proper diet, lifestyle changes, pharmacotherapy if indicated, use of dCBT, and associated campus resources that

would aid in each patient's management plan. It is essential that undergraduate and graduate nursing students understand how these factors can all contribute to the holistic nature of depression treatment if they want to improve depression symptoms in their patients once they become providers in any clinical setting.

Education on early identification of depression symptomology is also key. Through the education of screening modalities, such as use of PHQ-2 and PHQ-9, clinical providers and staff will be better prepared to implement these screening tools within their healthcare organizations and routinely administer these screenings to identify any cases of new onset depression symptoms. It is imperative that the negative stigma of mental health be reduced, and a method of achieving this is through having open conversations regarding screening and routinely discussing results of the screenings to patients as well.

For nurses and APRNs to facilitate change in patient behavior, they should have a strong foundation in screening and diagnosis of depression, how interventions work, and be able to communicate these aspects in a manner that patients can understand. There should also be an understanding of how a shared decision-making process between providers and patients can further empower patients to change their behavior and adhere to intervention strategies. For young adult patients, it is imperative that the negative stigma of mental health be reduced and a method of doing this is by nurses and APRNs engaging their student health centers to become connected with other campus resources, such as fitness facilities or counseling centers. This collaboration can aid in creating college and university campuses that are aware of the importance of mental health, and the free resources available to students throughout their academic careers.

Conclusion

Depression is known as one of the most prevalent mental health conditions in the United States and is the leading cause of disability worldwide (Anxiety and Depression Association of America, 2023). It is significant to note that many individuals will experience their first episode of

depression in the second decade of life, before the age of twenty (Malhi et al., 2020). For this reason, it is imperative that APRNs and other primary care providers, especially those that care for young adult populations, play an integral role in treatment of depression. With this mission in mind, the purpose of this project was to increase early identification and management of depression in a university student health center setting. Results from this EBP project demonstrated that implementation of a universal depression screening protocol was statistically and clinically significant. In addition, implementation of a combination of depression management strategies demonstrated a statistically significant reduction in mean PHQ-9 scores of ten participants after 8-weeks of implementation.

This project serves as a framework for nurses and APRNs in implementing a holistic approach of non-pharmacological and pharmacologic treatments to manage depression symptoms in a student health center setting. This project can also serve as a model to further integrate and enhance the collaboration of student health centers with other campus resources, such as fitness facilities and university counseling centers. The importance of raising awareness on the early identification of depression symptomology to provide young adult patients with appropriate support was also identified in this project. This early identification can play a role in decreasing the negative effects that depression can have on student academic progress and their personal progression throughout life. Research should aim to identify barriers and solutions to implementing psychological interventions for depression in young adult populations. Future development of depression screening tools that are specific to young adults should also be investigated.

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BIOGRAPHICAL MATERIAL

Ms. Jessica Monjaras graduated from Purdue University in 2015 with a Bachelor of Science in Biology with minors in psychology and Spanish. She continued her education at Valparaiso University where she graduated Cum Laude from Valparaiso University's accelerated baccalaureate nursing program in 2020 with a Bachelor of Science in Nursing. Ms. Monjaras has primarily worked in an inpatient acute rehabilitation setting as a nurse and charge nurse. The pursuit of her Doctor of Nursing Practice (DNP) began in the fall of 2020, and she will graduate in May of 2024. She is a member of campus and professional organizations including Sigma Theta Tau Honor Society of Nursing (Zeta Epsilon Chapter), American Association of Nurse Practitioners (AANP), and the Midwest Nursing Research Society (MNRS). During her time as a graduate student, she was selected to be part of a culture immersion trip to Italy and gained valuable lessons regarding their diverse culture and healthcare system. Ms. Monjaras was also invited to present her evidence-based practice project poster at the 48th annual Midwest Nursing Research Society Conference in Minneapolis, Minnesota. Throughout Valparaiso University's DNP program, Ms. Monjaras has enjoyed developing relationships with patients she has encountered and following them through their health care journey. She aspires to also pursue a career in academia to aid in guiding and mentoring others in their pursuit of excellence in healthcare. Following graduation and certification, Ms. Monjaras plans to use her passion, experience, and education to care for underserved populations in Northwest Indiana as a family nurse practitioner.

ACRONYM LIST

ACHA: American College Health Association

AGREE II: Appraisal of Guidelines for Research & Evaluation II

APRN: Advanced Practice Registered Nurse

CBT: Cognitive Behavioral Therapy

CINAHL: Cumulative Index to Nursing and Allied Health

CITI: Collaborative Institutional Training Initiative

CPG: Clinical Practice Guideline

dCBT: Digital Cognitive Behavioral Therapy

DSM-V: Diagnostic and Statistical Manual of Mental Disorders-5

EBP: Evidence-Based Practice

EMR: Electronic Medical Record

FNP = Family Nurse Practitioner

iCBT: Internet-Delivered Cognitive Behavioral Therapy

ICD-11: International Classification of Diseases, 11th revision

JBI: Joanna Briggs Institute

NP: Nurse Practitioner

PHQ-2: Patient Health Questionnaire-2

PHQ-9: Patient Health Questionnaire-9

SGA: Second-Generation Antidepressant

SSRI: Selective Serotonin Reuptake Inhibitors

SNRI: Serotonin-Norepinephrine Reuptake Inhibitors

TAO: Therapy Assistance Online

TRIP: Turning Research into Practice

USPSTF: U.S. Preventative Services Task Force

APPENDIX A

Johns Hopkins EBP Model and Tools - Permission

JOHNS HOPKINS EBP MODEL AND TOOLS- PERMISSION

Johns Hopkins Nursing
Center for Evidence-Based Practice

Thank you for your submission.
We are happy to give you permission to use the Johns Hopkins Evidence-Based Practice model and tools to adhere to our legal terms noted below.
No further permission for use is necessary.

You may not modify the model or the tools without written approval from Johns Hopkins.
All references to source forms should include "© 2022 Johns Hopkins Health System/Johns Hopkins School of Nursing."
The tools may not be used for commercial purposes without special permission.
If interested in commercial use or discussing changes to the tool, please email ijhn@jhmi.edu.

Available Downloads:

2022 JHEBP Tools- English version

2022 JHEBP Tools- Spanish version

2022 JHEBP Tools- Chinese version

2022 JHEBP Tools- Portuguese version

Would you like to join us? *Group rates are available, email ijhn@jhmi.edu to inquire.*

EBP Boot Camp: We are offering a 5-day intensive Boot Camp where you will learn and master the entire EBP process from beginning to end. Take advantage of our retreat-type setting to focus on your project, collaborate with peers, and get expertise and assistance from our faculty. ***COMING in 2024!***

EBP Skill Build: This 3-day virtual workshop gives you a front-row seat to our EBP training and provides every participant with the guidance and support they need to get their EBP projects started.

Appendix B

Evidence Table

Lead Author/ Year	Purpose/ Design/Sample	Interventions	Measurement/ Outcomes	Results/ Findings	Strengths/ Limitations
Level I Evidence					
Aginga (2022).	**Purpose:** To determine the best available evidence regarding the effectiveness of cognitive behavioral therapy (CBT) for the treatment of depression in adults. **Design/Sample:** 7 pieces of high-quality evidence were utilized for this evidence summary.	Use of CBT for treatment of adult depression.	Reduction of depression symptoms.	Level 1 evidence from 7 pieces of evidence suggesting that CBT should be considered in the treatment of depression, including major depressive disorder in adults. It is also suggested that CB may be considered for treatment resistant depression in adults.	**Strengths:** Strong description of studies included in the evidence summary and number of participants. **Limitations:** One piece of evidence, a systematic review, focused on older adults with depression.
Andrews et al. (2018).	**Purpose:** A meta-analysis which searched	Internet-delivered CBT	Reduction of symptoms of major depression.	The combined Hedges' g for Major Depression was 0.67 (CI 0.51 -0.81).	**Strengths:**

	for studies on the effectiveness of iCBT in clinical practice was conducted. **Design/Sample:** Databases, reviews, and meta-analyses were searched for randomized controlled trials of cCBT or iCBT versus a control group (care as usual, waitlist, information control, psychological placebo, pill placebo, etc.) in individuals who met diagnostic criteria for major depression, panic disorder, social anxiety disorder, or generalized anxiety disorder. Number randomized, superiority of treatment versus control (Hedges'			"Maintenance of improvement at follow-up was demonstrated with small but significant, effect size superiority at both 3-6 and 9-18 month follow-up. The results are indicative of both short- and long-term benefit"(p. 76). "64 identified iCBT trials generated large effect size superiority over control groups, with maintenance of benefit at follow-up, acceptable patient adherence and high-rates of satisfaction and now with evidence of effectiveness in routine practice" (p. 77)	Evidence in this meta-analysis supports the original claim that iCBT is efficacious and acceptable, and also provides an increase in access to treatment for individuals suffering from depression and anxiety. **Limitation:** There were no studies comparing iCBT with pill placebo, or iCBT with pharmacotherapy. Further research is needed in this area. The iCBT courses were also diverse in nature. The form in which information was

	g) on primary outcome measure, length of follow-up, follow-up outcome, patient adherence and satisfaction/harm were extracted; risk of bias was assessed.				provided included various methods such as use of text, audio, video, cartoon story lines, assignments, and/or use of supplementary material. Also, evidence not only specific to depression.
APA (2019).	**Purpose:** Clinical practice guideline developed to provide recommendations for the treatment of depressive disorders (including major	Addresses three developmental cohorts: children and adolescents, general adults, and older adults ages 60 and over.	No outcome measures.	For initial treatment of adult patients with depression, guideline recommends the following in the context of sharing decision-making with patient when considering options: 1,That clinicians offer either psychotherapy or	**Strengths:** Reputable source, references available, United States guideline, clear recommendations for adults provided.

	depression, subsyndromal depression, and persistent depressive disorder. **Design:** No design; Clinical Practice Guideline			second-generation antidepressant. When selecting between treatments, recommendations include following options: -second-generation antidepressants -General models of psychotherapy that appear to have comparable effects include: -behavioral therapy CBT and mindfulness-based cognitive therapy. -interpersonal psychotherapy -psychodynamic therapies -supportive therapy. 2. If considering combination treatment, the panel recommends CBT or interpersonal psychotherapy plus a second-generation antidepressant.	**Limitations:** Guideline not specific to adults, also includes information on children, adolescents, and older adults age 60 and over.
Karyotaki et al. (2021).	**Purpose:** To evaluate the effectiveness of guided versus unguided internet-based cognitive behavioral	Guided and unguided iCBT for individuals with depression.	Main Outcomes and measures focused on Patient Health Questionnaire-9 (PHQ-9) score.	Guided iCBT was more effective than unguided iCBT (SMD: -0.8; 95% CI: -1.4 to -0.2) based on Patient Health Questionnaire scores.	**Strengths:** The risk of bias was low, no strong evidence for small-study effect sizes, publication bias,

	therapy for individuals with depression. **Design/Sample**: Systematic review and meta-analysis consisting of 39 randomized clinical trials with a total of 9,751 participants.			Although guided iCBT was associated with greater improvement compared with unguided iCBT on average, many individuals with depression may still benefit from the iCBT without therapeutic guidance. Individuals with mild/subthreshold depression was associated with little or no benefit from therapeutic guidance. Guided iCBT was more effective in individuals with moderate and severe depression. Both iCBT modalities outperformed treatment as usual regardless of depression severity. Both guided and unguided iCBT were associated with more effectiveness as measured by PHQ-9 scores than control treatments over the short term and long term.	or network inconsistency. **Limitations:** Only nine studies recruited patients mainly from clinical settings.
Malhi et al. (2021).	**Purpose:** Clinical practice guideline summary focusing on the	Recommendations for management of depression are made within the guideline. The Actions, Choices,	No outcome measures.	No results. The clinical guideline utilized high quality evidence to guide clinicians to treat depression effectively in	**Strengths:** Reputable source, references available,

	management of mood disorders. **Design:** No design; Clinical Practice Guideline	and Alternatives framework for the management of mood disorders is utilized.		routine clinical practice settings, minimize adverse effects of treatment, and identify maintenance treatment recommendations. The Actions, Choices, and Alternatives framework for the management of mood disorders is utilized to guide providers in recommendation for management and treatment of MDD. - Evidence suggests that digitally delivered interventions, such as digital CBT, may have equivalent efficacy to in-person treatment for major depressive disorders but with significant costs benefits. MoodGYM application is referenced as a digital CBT recommendation. -Exercise as a lifestyle modification is identified with guidelines and resources identified that clinicians can refer to aid patients in creation of an exercise plan.	framework provided is clear. Clear information on resources for lifestyle modification and psychological intervention options. **Limitations:** Also includes recommendations regarding bipolar disorder and mood disorders in children and adolescents (not exclusive to depression in adults), no specific cutoff points regarding severity of depression to determine specific management option for clinician to offer. Not specific to the

					college-aged population. Not specific to United States population.
Malhi et al. (2020).	**Purpose:** Clinical practice guideline summary focusing on the management of major depression. **Design:** No design; Clinical Practice Guideline	Recommendations for management of depression are made within the guideline. The Actions, Choices, and Alternatives framework for the management of mood disorders is utilized. .	No outcome measures.	No results. The clinical guideline utilized high quality evidence to guide clinicians to treat depression effectively in routine clinical practice settings, minimize adverse effects of treatment, and identify maintenance treatment recommendations. The Actions, Choices, and Alternatives framework for the management of mood disorders is utilized. The framework contains three components which include the following: 1). Actions – form the foundation of management and should be instituted whenever possible. These include lifestyle changes, psychoeducation, and psychological interventions such as cognitive behavioral therapy (CBT) and counseling services.	**Strengths:** Reputable source, references available, framework provided is clear. **Limitations:** No specific cutoff points regarding severity of depression to determine specific management option for clinician to offer. Not specific to the college-aged population. Not specific to United States population.

				Lifestyle modifications include sleep hygiene, regular exercise, diet, limiting alcohol use, cessation of smoking, and identification of medications that can alter mood. 2) Choices – involves pharmacotherapy options which are outlined within the guideline. They can also be utilized as part of more complex regimens involving combinations and alternative treatment strategies. 3) Alternatives - Includes complex medication strategies and physical treatments such as electroconvulsive therapy -If the “Actions” outlined in framework prove to be insufficient to achieve remission of depressive symptoms, and the patient is amenable to pharmacotherapy, then an antidepressant should be prescribed. In some cases, an antidepressant can be prescribed from	

				the outset if indicated by clinical presentation and provider clinical judgment. - Evidence suggests that digitally delivered interventions, such as digital CBT, may have equivalent efficacy to in-person treatment for major depressive disorders but with significant costs benefits. -Evidence supports the conclusion that for all severities of depression the most effective treatment is a combination of psychological interventions and pharmacotherapy. It is recommended that structured psychological intervention is foundational in the treatment of all depressive presentations.	
NICE. (2022).	**Purpose:** Clinical practice guideline specifically aimed towards	In development of the guideline, the committee defined new episodes of	No outcome measures.	No results. The clinical guideline utilized high quality evidence to guide clinicians to identify	**Strengths:** Reputable source, clear statements of

	the identification, treatment and management of depression in individuals aged 18 and over in a routine clinical practice setting Recommendations include those for treatments for first episodes of depression and further-line treatments. **Design:** No design; Clinical Practice Guideline	depression as less severe and more severe depression. Less severe depression encompasses subthreshold and mild depression. More severe depression encompasses moderate and severe depression. Thresholds on validated scales were utilized as an indicator of severity. A score of less than 16 on the PHQ-9 scales is defined as less severe depression, and scores of 16 or greater are defined as more severe depression. Recommendations included for both less severe depression and more severe depression. Recommendations include lifestyle modifications, guided self-help, CBT, counseling services, and other psychological		depression in adults, treat depression effectively in routine clinical practice settings, minimize adverse effects of treatment, and identify when to refer to specialized treatment.	recommendations, resources provided for full details of evidence and guideline committee discussion. There are also links to tools and resources to aid practitioners in placing the guideline into practice. **Limitations:** This is not specifically aimed towards a university or college-aged population; however, it is aimed for individuals 18 and over. Lack of information on risk of bias.

		treatments, pharmacotherapy, and referrals to specialized treatment.			
Qaseem et al. (2023).	**Purpose:** Clinical practice guideline presents clinical recommendations on nonpharmacologic and pharmacologic interventions as initial and second-line treatments during the acute phase of major depressive disorder (MDD) episode. **Design:** No design; Clinical Practice Guideline	Recommendations for initial treatment of adults in the acute phase of MDD.	No outcome measures.	Recommendations provided are outlined below: Recommendation 1a: Recommendation of monotherapy with either cognitive behavioral therapy or a second-generation antidepressant as initial treatment in patients in the acute phase of moderate to severe major depressive disorder (strong recommendation; moderate certainty evidence). Recommendation 1b: Suggestion of combination therapy with CBT and a second-generation antidepressant as initial treatment in patients in the acute phase of moderate to severe depressive disorder (conditional	Strengths: Reputable source, generalizable, United States guideline, references available. Limitations: Not specific to college-aged patient population.

				recommendation; low-certainty evidence). “The informed decision on the options of monotherapy with CBT versus second-generation antidepressants or combination therapy should be personalized and based on discussion of potential treatment benefits, harms, adverse effect profiles, cost, feasibility, patients’ specific symptoms (such as insomnia, hypersomnia, or fluctuation in appetite), comorbidities, concomitant medication use, and patient preferences” (p. 239). Recommendation 2 Suggestion of monotherapy with cognitive behavioral therapy as initial treatment in patients in the acute phase of mild major depressive disorder (conditional recommendation; low-certainty evidence). Recommendation 3:	

				Suggestion of one of the following options for patients in acute phase of moderate to severe major depressive disorder who did not respond to initial treatment with an adequate dose of a second-generation antidepressant: -switch to or augment with CBT (conditional recommendation; low certainty evidence) -switch to a different second-generation antidepressant or augment with a second pharmacologic treatment (Conditional recommendation, low-certainty evidence).	
Slade. (2021a).	**Purpose:** To determine the best available evidence regarding the use of computerized cognitive behavioral therapy (CCBT) in the treatment	Use of computerized, or computer-assisted CBT for treatment of depression.	Reduction of depressive symptoms.	Level I evidence from 9 pieces of high-quality evidence suggesting the following: -Internet-based CBT may be considered in the treatment of individuals with depression or depressive symptoms and who are unable or	Strengths: Strong description of studies included in the evidence summary and number of participants. Limitations: none

	of depression in adults. **Design:** 9 pieces of high-quality evidence were utilized for this evidence summary. 1 systematic review and meta-analysis that included 8 randomized controlled trials, 2 RCTs, and 6 systematic reviews.			unwilling to access traditional face-to-face therapy. -Therapist supported or guided CCBT should be considered when utilizing internet-based CBT.	
Slade. (2021b).	**Purpose:** To determine the best available evidence regarding the effectiveness of exercise for adults with depression. **Design:** 11 pieces of high-quality evidence were utilized for this	Use of exercise as an intervention for treatment of depression. Exercises within the evidence include the following: aerobic exercise, strength exercise,	Reduction of depressive symptoms; effects of exercise on quality of life of adults with depression	Level I evidence from 11 pieces of high-quality evidence suggesting that exercise appears to have benefits in the reduction of depressive symptoms in adults. It is an inexpensive intervention that should be encouraged where safe and feasible for adults with depression or at risk of depression.	Strengths: Strong description of studies included in the evidence summary and number of participants. Limitations: Two systematic reviews focusing on older adult population.

	evidence summary. 10 systematic reviews, and 1 RCT.				
U.S. Preventative Services Task Force. (2023).	**Purpose:** Evaluation of benefits and harms of screening, accuracy of screening, and benefits and harms of treatment of major depressive disorder and suicide risk in asymptomatic adults that would be applicable in primary care settings. **Design:**	Recommendation for screening of depression in the adult population (Grade B recommendation). Screening tools include Patient Health Questionnaire (PHQ) in various forms in adults. PHQ-9 is noted to incorporate questions that ask about suicidal ideation.	No outcomes measured.	Recommendation for screening of depression in all adults regardless of risk factors (Grade B recommendation). This recommendation applies to adults 19 years of age or older who do not have a diagnosed mental health disorder or recognizable signs or symptoms of depression and suicide risk. All positive screening results should lead to additional assessments to confirm diagnosis, symptom severity, and identify comorbid psychological problems. “There is little evidence regarding the optimal	**Strengths:** Reputable source, United States guideline, references available, and clear statement of recommendation for screening in adults provided. **Limitations:** Evidence is not specifically aimed towards a university or college-aged population. Also includes recommendation for screening

	No design; Clinical Practice Guideline			timing for screening for depression; more evidence is needed in both perinatal and general adult populations. In the absence of evidence, a pragmatic approach might include screening adults who have not been screened previously and using clinical judgement…"(p.2061).	of older adults and pregnant and postpartum individuals.
Level II Evidence (use this format to add additional levels as your evidence warrants)					
Löbner et al. (2018).	**Purpose:** To evaluate the effectiveness of a self-guided computerized cognitive behavior therapy for patients with mild to moderately severe depression in primary care. **Design/Sample:** A cluster randomized controlled trial. The patient sample was comprised of	Intervention included usual care plus information and access to the German version of the self-guided cCBT program *moodgym*. *Moodgym* is an internet-based, self-management program that was designed to prevent and alleviate symptoms of depression. The program consists of 5 interactive modules that are delivered in a specific order.	Primary outcomes were self-reported severity of depression, which was measured by the German language versions of the Beck Depression Inventory (BDI-II) and the Patient Health Questionnaire (PHQ-9) at six weeks and six months. Secondary outcomes included self-efficacy and health-related quality of life at six weeks and six months. The six-item Hope and Self-efficacy subscale from the questionnaire for the assessment of	"Primary care patients with symptoms of mild to moderately severe depression benefited from augmenting usual care with GP supported self-guided cCBT. Participants with access to *moodgym* experienced a more pronounced decline in depression symptoms measured by the BDI-II and PHQ-9 at six months, as compared to patients receiving usual care only" (p.322). Significance between group differences in depressive symptoms for BDI-II in favor of the	Strengths: Large sample size, broad focus on severity of depression including middle to moderately severe depression; reminders provided to patients (three postal reminders sent) to increase returned patient questionnaires for each assessment point and prevent

	adults 18 years of age and over, having a diagnosis of mild or moderate first or recurrent depressive episode according to ICD-10, and screening positive for mild to moderately severe depressive symptoms according the nine-item Patient Health Questionnaire (PHQ-9 score range of 5 to 19 points).	Use of *moodgym*was supported by general practitioners recommending it as an adjunct element of treatment.	empowerment in patients with affective and schizophrenic disorders was utilized for the secondary outcome of self-efficacy. For quality of life, a sum score was calculated from the items of the five-level version of the health state classifier EQ-5D of the EuroQol Group.	intervention group, corresponding to a small effect size (6 weeks: d=0.36, 95% CI 0.19 to 0.53, P < .001; 6 months: d=0.4, 95% 0.22 to 0.59, P,.001). PHQ-9 analysis was only significant at six months (d=0.26, 95% CI 0.08 to 0.44, P<.05, NNT = 9.2) Analysis of secondary outcomes revealed statistical evidence of a difference in EQ-5D-5L scores between the intervention group and control group at six weeks (t= 2.43, *p* <.05) and at six months (t- 2.38, *p* <.05). At six months, *moodgym*, was more effective in improving self-efficacy (NNT=6.4) and less effective in improving quality of life (NNT=12.5). Self-reported data on medication and service utilization during follow-up revealed that participants in both the intervention and control groups	potential dropout of participants. Limitations: Initial response rate of contacted GPs was low which may reflect negative attitudes toward Internet interventions. Focus was on a German population of primary care patients.

				received a range of treatments as part of treatment as usual. Treatments included psychotherapy contact, medication, and alternative treatments such as self-help groups.	
McCloud et al. (2020).	**Purpose:** To evaluate the effectiveness of a self-guided mobile app, Feel Stress free, for the treatment of depression and anxiety symptoms in university students. **Design/Sample:** Randomized controlled trial. Eligible participants were aged 18 and over, scored an eight or above on one or both subscales of the Hospital Anxiety and Depression Scale (HADS), which indicates at least a	Intervention included use of the *Feel Stress Free* application (self-guided). It includes four behavioral relaxation activities, one cognitive active, a relaxing minigame, and a feature for positive messages. Participants were instructed to utilize the application at least once per week, spending at least 10 minutes on one or more of the main activities throughout the trial timeframe. There were no prompts or reminders to use the application.	The Hospital Anxiety and Depression Scale (HADS), is an established measure of the severity of anxiety and depression symptoms and has been validated for use in a student patient population. Primary outcomes were depression and anxiety symptom severity at week 6, as measured by two subscales of the HADS which include the HADS-A for anxiety symptoms and HADS-D for depression symptoms. Secondary outcomes included HADS-A and HADS-D scores at baseline (screening), week 2, and week 4.	During week 6 of the trial (end-point), there is evidence that the *Feel Stress Free* application reduced depression symptoms (mean difference -1.56; 95% CI-2.67 to -0.44; P =.006) but only weak evidence that it reduced anxiety symptoms (mean difference -1.3; 95% CI -2.93 to 0.21; P=.09). At week 6, 83% of participants indicated that they were using the application weekly.	**Strengths:** Adherence to the application was defined and measures; high external validity; HADS was collect at baseline, 2 weeks, 4 weeks, and 6 weeks. **Limitations:** Attrition, only 58% of participants completed the week 6 questionnaires.

	possible case of depression and/or anxiety, were currently students at a partnered university, had access to an smartphone, or computer, and were computer and internet literate. 168 participants were randomized, 84 to each study arm (intervention group or wait-list group).				
McDermott & Dozois. (2019).	**Purpose:** Comparison of the effectiveness of two internet-delivered interventions, CBT and attentional bias modification (ABM), in the prevention and early intervention of	Intervention included the use of either one of the following: -MoodGYM/CBT -ABM task -Attentional control condition Participants completed their assigned intervention during the 6 weeks	The Kessler Distress Scale and NEO Five-Factor Inventory were utilized to assess eligibility. Beck Depression Inventory II symptom scores and Depression Anxiety Stress Scale-21 symptom scores were assessed across conditions at baseline,	"Participants in the CBT condition showed more dramatic and continuous depressive symptom improvement between baseline and follow-up than did participants in the other two conditions" (p.1). **Beck Depression Inventory-II:**	**Strengths:** Randomization; Reminders provided to patients to complete interventions. **Limitations:** The Structured Clinical Interview for the DSM-IV, non-

	depression in at-risk undergraduate students. **Design/Sample:** Randomized controlled trial. Participants were comprised of first-or second-year undergraduate students, were fluent in English, have ability to access Internet on computer or touch-screen device, and were between the ages of 17 and 64. Participants also need to score 22 or higher on the Kessler Distress Scale (K-10) or 35 or higher on the NEO Five-Factor Inventory (NEO-FFT). 350 participants completed symptom	following their baseline session: -Participants in CBT condition underwent six weekly sessions of MoodGYM. They were asked to spend 40 minutes a week on the modules, complete sessions in one sitting, and only log onto the platform when prompted. -Participants in the ABM and control intervention were to complete 12, 20-minute semi-weekly sessions. They were prompted to complete tasks every 3 to 4 days and were to complete tasks in one sitting and use the same device each time.	post-intervention, and follow-up. The Structured Clinical Interview for the DSM-IV, non patient version was administered over the phone at follow-up and participants were interviewed about current and past depressive episodes.	The CBT condition significantly outperformed the ABM condition, $F(1,668) = 2.09$, $p < .037$. The CBT group also improved to a greater extent than the ABM group over time, F (1, 688) = 11.95, p <.001). **Depression subscale of the DASS-21:** "Participants' improvement was compared from baseline to post-intervention. There was no significant difference between the attentional conditions, $F(1, 668) = 1.70$, p+ .09, but the CBT condition showed significantly greater improvement than did the ABM conditions, $F(1,668) = 9.00$, $p < .001$)"(p.8). From baseline to follow-up, the CBT condition improved more than did the ABM group, $F(1,668) = 10.66$, p <.001. The CBT condition also exhibited fewer cases of	patient version, was not administered at baseline (participant recall bias). Participants were financially compensated for participation which can limit generalizability of the findings.

	measurement pre- and post-intervention (6 weeks), and again at a 4 month follow-up, when they were also administered a structured diagnostic interview.			major depressive disorder at follow-up.	
Level VI Evidence					
Bever & Maks. (2023).	**Purpose:** Quality improvement project with the purpose of addressing mental illness among college students and implementation of evidence-based strategies to promote adequate identification of individuals with depression and to promote	Protocol involved adding PHQ-2 to intake forms for each student presenting to the clinic for a nonmental health visit. For students who screen positive on PHQ-2 (score of ≥3), the student would receive the PHQ-9 screening tool. Students who scored positive on the PHQ-9 (≥10) would receive a referral back to the university clinic or to	Follow-ups were tracked for patients who screened positive. Screening rates were measured pre- and post-intervention.	Before implementation , the clinic did not utilize the PHQ-2 and used the PHQ-9 only during mental health visits. Results suggest that depression screening increased from an assumed 0% to 98.03%. Results suggest that the protocol was successful at increasing depression management due to appropriate referrals increasing from an assumed 0% to 93.33%.	**Strengths:** Depression screening rates increased; supports evidence regarding universal depression screening combined with follow-up systems to ensure appropriate diagnosis and management.

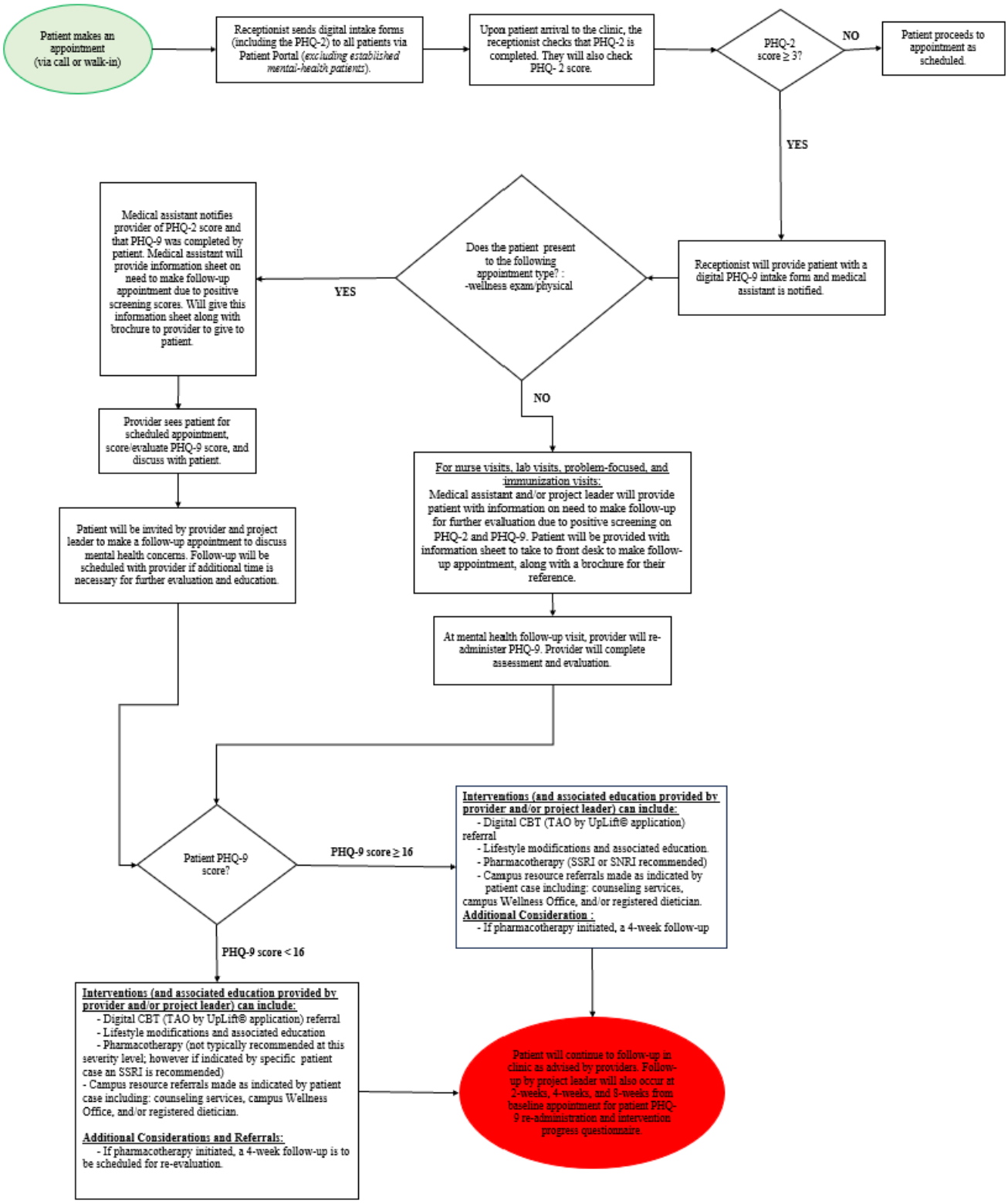
	subsequent appropriate referrals. **Design:** Retrospective chart review: 304 EMRs were reviewed for visit type, PHQ-2 completion and score, and PHQ-9 completion and score.	university counseling services.			**Limitations:** Single clinical site decreases generalizability, no tracking of results of treatment/management after referral.
Slabaugh et al. (2018).	**Purpose:** Purpose to implement a quality improvement project for standardized screening and referral of depressive symptoms and identify factors related to mentoring program interest in a college health clinic. **Sample:** All students with NP appointments	Protocol involved adding PHQ-2 to intake forms for each student presenting to the clinic for a nonmental health visit. For students who screen positive on PHQ-2 (score of ≥3), the student would receive the PHQ-9 screening tool. Students with a negative on PHQ-2 (< 3) or PHQ-9 (<10) received a printed educational handout from the National Institute of Mental Health.	Analysis focused on frequencies and relative frequencies of various PHQ-2 and PHQ-9 scores and mentoring interest.	Of students receiving primary care services at a college health center, 221 completed demographic surveys, 165 completed the PHQ-2, and eight students received interventions for positive screens. In general, 76.4% of students expressed definite or possible interest in a mentoring program to manage stress, anxiety, or depression. Project demonstrates ease of standardized screening in the college health setting without	**Strengths:** Supports evidence regarding universal depression screening combined with follow-up systems to ensure appropriate diagnosis and management. **Limitations:** Single clinical site decreases generalizability, no tracking of results of treatment/management

	were recruited for participation. Most students were traditional college-aged males and females (18-22).	For PHQ-9 scores > 10 , a follow-up visit was strongly encouraged (on or off campus, provider or counselor based), and an educational handout was provided. For scores ≥ 20 on the PHQ-9 or >0 on the suicide question (#9), depression evaluated by NP immediately and appropriate treatment initiated.		excessive burden to staff or budget.	gement after referral.
Yates et al. (2020).	**Purpose:** The purpose of pilot project was to establish an interprofessional collaborative process for managing depression treatment for college students with prescribed exercise as a part of their treatment plan. **Design/Sample:** Quasi-Experimental:	Intervention consisted of a prescribed exercise program. Participants were referred to a wellness coaching program and were assigned a wellness coach who conducted fitness assessments and developed individualized exercise plans for students. Exercise plans included a combination of aerobic, strength, and stretching movements.	PHQ-9 was utilized for screening. Each participant completed the PHQ-9 before beginning the wellness coaching program and upon completion of at least 4 weeks of exercise.	"There was a statistically significant decrease in PHQ-9 scores from baseline (8.78±3.53) to follow-up assessment (5.44±2.92), t(8) =2.46, P=.039, two-tailed. The mean decrease in PHQ-9 scores was 3.33 with a 95% confidence interval ranging from 0.21 to 6.46" (p.897). "Prescribed exercise for the treatment of depression in adults has demonstrated effectiveness, both as monotherapy, and as an	**Strengths:** Email, text, or phone call reminders provided regarding wellness coaching appointments, and encouragement to adhere to exercise plan/goals. Follow-ups were also conducted with the project leader.

	Pretest/posttest design. Ten participants were enrolled, and nine participants completed the requirement of 4 weeks of exercise. All participants were prescribed antidepressant medications as part of their treatment and half of the participants were also engaged in psychotherapy through a counseling center.			adjunct to standard medication and psychotherapy interventions" (p. 898).	**Limitations:** Small number or participants; No comparison group; short duration of data gathering.

APPENDIX C

EBP Project Process Flowchart



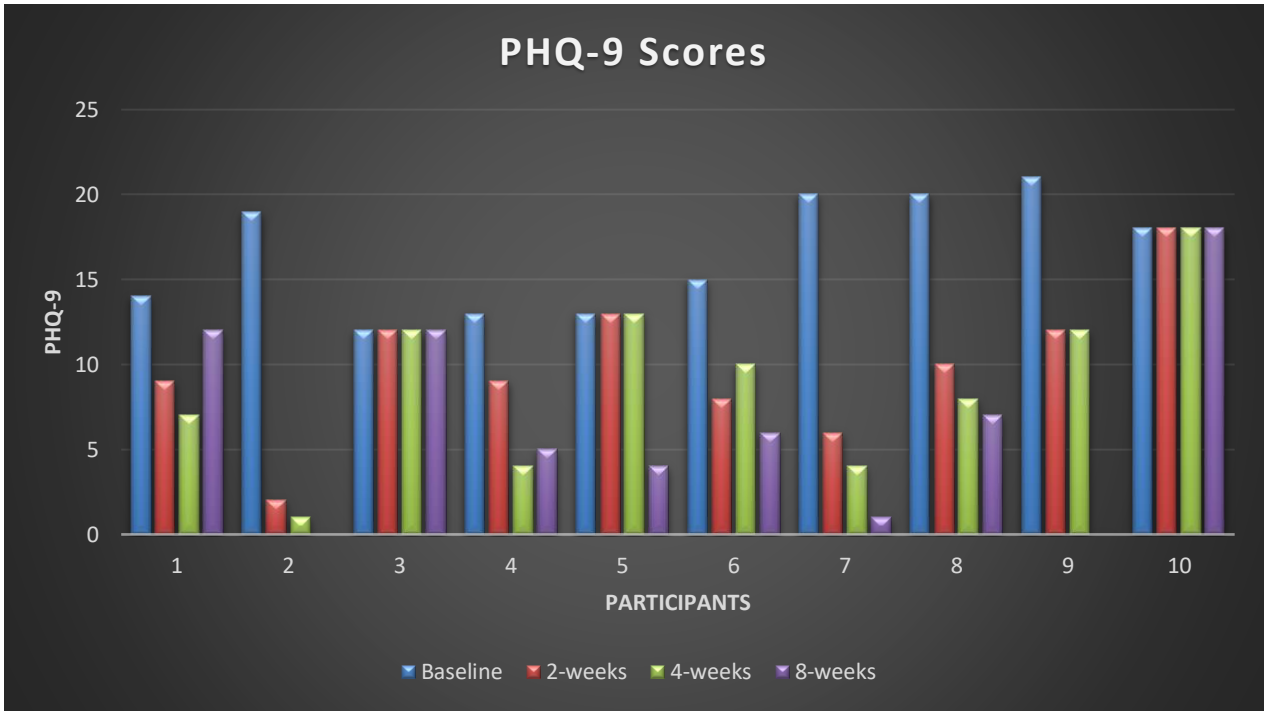
APPENDIX D

Implementation Calendar

September 2023	**September 6:** • Final presentation with health center staff to discuss EBP project roles and implementation guidelines. **September 11:** • EBP two-tiered universal depression screening and project recruitment start date.
October 2023	• Continued two-tiered universal depression screening. • Continued recruitment of eligible participants. • Follow-up calls with participants. • Continued data collection.
November 2023	• Continued two-tiered universal depression screening. • Continued recruitment of eligible participants. • Follow-up calls with participants. • Continued data collection.
December 2023	• Continued two-tiered universal depression screening. • Continued recruitment of eligible participants. • Follow-up calls with participants. • Continued data collection. **December 1:** • Last day of EBP project recruitment. • Data collection of total number of patients between September 11, 2023, to December 1, 2023, in addition to the total number of newly identified patients with depression symptomology.
January 2024	• Retrospective chart review and data collection of preceding timeframe of September 11, 2022, and December 1, 2022, to determine newly identified patients with depression symptomology before universal depression screening and total number of patients. **January 19:** • Final date for follow-up with participants and associated data collection.

Appendix E

Individual Participant PHQ-9 scores at baseline, 2-weeks, 4-weeks, and 8-weeks



Appendix F

Mean PHQ-9 scores at baseline, 2-weeks, 4-weeks, and 8-weeks