Access to Healthcare Among Those Experiencing Homelessness: A depression Screening Project

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Abstract

Homeless individuals encounter barriers such as lack of health insurance, increased cost of care and unavailability of resources. They have increased risk of comorbid physical disease and poor mental health. Depression is a prevalent mental health disorder in the US linked to increased risk of mortality. Literature suggests depression screening can identify high-risk individuals with using the patient health questionnaire (PHQ-9). The objective of this project is to determine if screening identifies depression in the homeless and how it impacts healthcare access. Setting is a local organization in Phoenix offering shelter to homeless individuals. An evidence-based project was implemented over two months in 2019 using convenience sampling. Intervention included depression screening using the PHQ-9, referring to primary care and tracking appointment times. IRB approval obtained from Arizona State University, privacy discussed, and consent obtained prior to data collection. Participants were assigned a random number to protect privacy. A chart audit tool was used to obtain sociodemographics and insurance status. Descriptive statistics used and analyzed using Intellectus. Sample size was (n = 18), age (M = 35) most were White-non-Hispanic, 44% had a high school diploma and 78% were insured. Mean score was 7.72, three were previously diagnosed and not referred. Three were referred with a turnaround appointment time of one, two and seven days respectively. No significant correlation found between age and depression severity. A significant correlation found between previous diagnosis and depression severity. Attention to PHQ-9 varied among providers and not always addressed. Future projects should focus on improving collaboration between this facility and providers, increasing screening and ensuring adequate follow up and treatment.

Keywords: Access to healthcare, homeless, depression, screening, PHQ-9

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Access to Healthcare Among Those Experiencing Homelessness: A depression Screening Project

Homelessness has been recognized as a global phenomenon, affecting impoverished populations in both developed and developing countries (Busch-Geertsema, Culhane & Fitzpatrick, 2016). It can be described as an individual who is without a permanent, consistent, and adequate residence, living in a shelter or place not designed for human habitation, including those who are at imminent risk of housing loss and people escaping from domestic violence with inadequate resources to obtain permanent housing (Baggett, 2018). These individuals are affected by a variety of health disparities, limiting the amount and quality of health care services they receive. Factors impacting health disparities include level of education, socioeconomic status, health literacy, gender, race or ethnicity and geographic location. Access to essential healthcare is an important aspect of everyday life and allows individuals to maintain health, manage chronic conditions and prevent complications. Homelessness often leads to lack of health insurance, decreased use of preventative health services, poor health outcomes and increased disability and mortality.

Background and Significance

Individuals can experience homelessness in diverse forms, this could be transient, intermittent or chronic. Initially considered to be primarily composed of men, the homeless population today includes women, children and families (Katz, 2017). According to the United States Department of Housing and Urban Development (HUD) (2019) 567,715 or 17 of out every 10,000 individuals experienced homelessness in a single night in the year 2019. Seventy percent were adults without children and 30% were individuals and their families (HUD, 2019). Children comprised 19% or 107,069 individuals, eight percent were between 18 and 24 years of age, and about 75% were over the age of 25 (HUD, 2019). Sixty one percent or 343,187 were

men or boys, 39 % or 219,911 were women or girls, and less than one percent were transgender (3,255) or gender non-conforming (1,362) (HUD, 2019).

HUD (2019) reports the total number of homeless individuals in the nation increased by three percent or 14,885 individuals from the year 2018 and out of those 96,141 individuals experienced chronic homelessness. The Arizona Department of Economic Security (DES) (2019) reports in one single night there were 3,426 sheltered and 3,188 unsheltered individuals in Maricopa county. There were 1,011 sheltered, 361 unsheltered individuals in Pima County and 1,039 sheltered and 983 unsheltered individuals in balance of state (BOS) or areas of Arizona outside of the Maricopa and Pima counties (DES, 2019).

Problem Statement

Current literature demonstrates being homeless results from macro and micro-level contributions (Barile, Pruitt & Parker, 2018). Macro-level influences include housing difficulties, changes in social policy, reduction in public housing, income inequity, poverty and unemployment (Barile et al., 2018). Micro-level influences include individual vulnerabilities such as low income, dysfunctional family or changes in family dynamics, military veteran status, increased debt, alcohol or substance abuse, lack of education, mental and physical disabilities and lack of adequate social support (Barile et al., 2018).

A multidimensional approach must be applied to adequately treat the complex healthcare needs of these individuals and reduce the associated morbidity and mortality of being homeless. Primary care is thought to be essential healthcare that is practical, scientifically sound, includes socially acceptable methods of technology, it is universally available and cost-effective to the community and country (Campbell, O'Neill, Gibson & Thursto, 2015). Inadequate access to

primary and preventative services leads to frequent misuse of emergency services and limited continuing care for chronic disease and psychiatric illnesses for these vulnerable individuals.

Purpose and Rationale

Mental health encompasses emotional and psychological well-being and it is an important part of being a healthy individual. Homelessness can leave an individual vulnerable to mental and physical health problems, violence and substance abuse (Dai & Zhou, 2020). Equally, evidence suggests that homelessness can be triggered or worsened by health issues, particularly mental illness and learning disabilities (Dai & Zhou, 2020). Homeless individuals experience health complications throughout their lifetime and thus seek medical services for a variety of reasons. Unfortunately, access to quality healthcare is not always possible due to compounding factors, most frequently lack of insurance coverage.

Depression is the most prevalent mental health disorder in the United States, with a lifetime prevalence estimated to be 17% (Meyers, Groh, & Binienda, 2014). Approximately 17.3 million adults had at least one major depressive episode in the year 2017 (National Institute of Mental Health, 2019). It is associated with high mortality and impaired ability to effectively manage other chronic disease (Siu et al., 2016). The economic burden of depression in the United States is estimated at $210 billion annually, and worldwide, depression is the leading cause of disability (Schaeffer & Jolles, 2019). The goal of Healthy People 2020 (2019), is to improve access to comprehensive, quality health services to promote and maintain health, prevent and manage disease, reduce unnecessary disability and premature death, and achieve health equity for all Americans. The purpose of this paper is to discuss vulnerable populations, explore barriers to healthcare and determine how the utilization of valid and reliable screening tools helps identify depression and impact on health and access to care.

Epidemiological data

Being homeless is associated with poor health and premature mortality. Homeless individuals are challenged with triple morbidity that encompasses physical illness, mental illness and substance abuse leading to complications and complex healthcare needs (Elwell-Sutton, Holland, Fok, Albanese & Mathie, 2017). These problems contribute to an increase in premature mortality with an average life expectancy of 42 to 52 years of age (Bernstein, Meurer, Plumb & Jackson, 2015). Additionally, deaths in this population are related to unintentional injuries, suicide and homicide, mental disorders, communicable infectious disease and cardiovascular disease (Slockers, Nusselder, Rietjens & Van Beeck, 2018). Furthermore, acute and chronic respiratory, digestive and musculoskeletal disorders burden these individuals (Kaduszkiewicz, Bochon, Van den Bussche, Hansmann-Wiest & Van der Leeden, 2017).

In addition to somatic complaints, they are also exposed to extreme heat, cold, poor diet or insufficient food, and lack of personal hygiene leading to sustainability of infections and parasitic infestations (Kaduszkiewicz et al., 2017). According to Kaduszkiewicz et al. (2017) of the homeless individuals who accessed medical care, 75% had a mental disorder requiring treatment and 74% had a concurrent substance induced disorder. However, their inability to receive preventive health services or healthcare services in general leaves them vulnerable, and to many of them the hospital becomes an important source of healthcare. They become susceptible to unnecessary hospitalizations due to outpatient conditions that frequently go unaddressed (White & Newman, 2015).

The high rates of acute care use including emergency room visits and inpatient hospitalizations, has become a pattern seen in many countries and healthcare systems with and without universal health insurance (Fazel, Geddes, & Kushel, 2014). Once admitted, these

individuals are also responsible for longer hospitalizations of at least two days or more (Fazel, Geddes, & Kushel, 2014). They are three times more likely to be admitted, and three times more likely to stay hospitalized than the general population (Medcalf & Russell, 2014). Additionally, individuals experiencing homelessness also have high readmission rates and longer hospitalizations due to discharge delays (Shetler & Shepard, 2018). The consequences are unforeseen secondary healthcare costs that are eight times higher than patients who are not homeless (Medcalf & Russell, 2014).

A variety of interventions are presently being implemented to improve the access to healthcare for vulnerable populations. A systematic review of interventions to improve access to care listed the most common interventions as continuity of care via case management, formal integration of services both medical and social, multidisciplinary clinical teams and institutional incentives (Khanassov et al., 2016). Homeless individuals are faced with a diversity of social determinants of health that impact their overall health. Social determinants of health are known as conditions in which people are born, grow, live and interact on a daily basis. These include education, race, ethnicity, sex, sexual orientation, and place of residence (Adler, Glymour & Fielding, 2016). The incorporation of social determinants of health into clinical practice is also a crucial approach to effectively manage the needs of vulnerable populations (O'Toole, Johnson, Aiello, Kane & Pape, 2016).

Health screening is vital to maintain health and identify problems before they arise. It allows health providers to assess an individual’s risk for the development of certain diseases. Depression is a common and significant healthcare problem. The U.S. Preventive Services Task Force (USPST) recommends routine screening for depression in the general adult population and the development of adequate systems to ensure accurate diagnosis, treatment and follow up (Siu

et al., 2016). Programs combining depression screening along with adequate support systems improve clinical outcomes in adults and the prompt treatment of depression decreases clinical morbidity (Siu et al., 2016).

Conclusion

Focus should be placed on improving the overall health of homeless individuals. Emphasis needs to be placed on preventing communicable disease, adequate and continuing treatment of mental health problems, substance abuse, chronic health conditions and increasing preventative health screening. A multidimensional approach must be applied to adequately treat these individuals and reduce morbidity and mortality associated with being homeless. Increasing the availability of affordable primary care services is a desirable policy that would increase primary care access (White & Newman, 2015). Additionally, health policy should focus on the creation of primary care programs that are multidisciplinary and integrated with mental health services, social and economic support, outreach strategies and focused on health promotion (Jego, Abcaya, Ștefan, Calvet-Montredon & Gentile, 2018). Routine depression screening along with collaborative approaches to interventions can help individuals be successful and healthy.

Internal evidence

A local non-profit organization located in the Phoenix metropolitan area, is dedicated to help underserved individuals. Their goal is to provide Christ-centered programs and services to help men, women, and children escape hunger and homelessness. This is possible through the services provided, and their success is determined through recovered individuals and how well they incorporate back into society with housing, jobs, and family reunification. This organization is not a medical facility, therefore, their gap in care comes from the inability to provide medical services directly to these individuals.

On admission to this organization, individuals answer a short health questionnaire. There is no comprehensive health screening, allowing individuals to potential go undiagnosed. They are quickly assisted in applying for government medical assistance. However, once approved, medical care is provided by a third-party mobile clinic once a week. When medical concerns arise, they must notify a member of the team. This sponsor contacts the only social worker at this facility who triages the concern and prioritizes individual's medical needs. The social worker does not have any official medical training which could lead to delays in care and negative patient outcomes if triaged incorrectly, making this an important safety concern.

PICOT Question

This inquiry has led to the PICOT question: In homeless adults, "how does using a valid and reliable tool to screen for depression compared to the usual screening questions affect the identification of depression and referrals over a period of two months?"

Literature Review and Search Strategy

An exhaustive search of the literature was conducted using the following databases PubMed, CINAHL and PsychInfo. The first search was conducted through PubMed using the terms 'depression', 'screening', and 'adults'. This search yielded 74,466 results. This search was then modified to the following terms: 'depression', 'screening' and 'homeless' yielding a search result of 175 potential articles. This search was further modified to include publications within the last five years (2014-2019) and only list articles written in the English language. This final search resulted in a total of 48 potential articles.

A second search was conducted through CINAHL using the terms 'depression', 'screening' and 'homeless'. This initial search only produced 23 results with dates ranging from 2001 to 2019. The search was modified with the additional following terms: 'depression',

'screening tool' and 'adults' which yielded 553 results. This search was once again modified to include publications ranging between 2014 and 2019, include 'all adults', 'males' and 'English' yielding a total of 153 results. Grey literature within this search yielded four dissertations.

A third search was conducted through PsychINFO. This advanced search included the terms 'patient health questionnaire', 'depression' and 'screening'. This search yielded 100 results with publication dates ranging from 1976 to 2019. The search was again modified to include publications between January 1st, 2014 to January 1st, 2019 yielding 99 results. Search was modified to include 'adulthood' and males yielding again 99 results. Within these results grey literature included two books and two dissertations. Local and national organizational publications and relevant academic books were reviewed.

Critical Appraisal and Synthesis of Evidence

The Melnyk and Fineout-Overholt's (2011) rapid critical appraisal tool was used to validate the quality and strength of evidence of a variety of research studies. Ten final studies were used for this review. The purpose of the studies, research questions, inclusion and exclusion criteria were clearly identified (Appendix A). The studies were high level evidence including one level I, nine level II, four randomized-controlled trials, one retrospective, one prospective repeated-measures and three cross-sectional designs (Appendix B). Most of the studies were conducted in the United States, one in Vietnam, one in Israel, one in Australia and one in India (Appendix B).

Nine of the studies included funding, however, no conflict of interest or bias was stated or identified (Appendix A). Seven of the studies were conducted in primary care settings and three were held in community centers such as homeless shelters and community health fairs (Appendix B). Sample sizes were adequate and dependent and independent variables were

clearly stated and understood (Appendix B). Many studies included an interdisciplinary, collaborative approach by incorporating education, counseling, exercise and medication treatment for depression (Appendix A). However, the main independent variable in all studies was depression screening and five studies included an additional psychosocial education variable (Appendix B).

Primary outcomes included identifying depression and monitoring depression severity (Appendix B). There was a significant amount of homogeneity with eight of the studies utilizing the Patient Health Questionnaire 9-item (PHQ-9) to screen and monitor depression (Appendix B). One study utilized both the Beck Depression Inventory (BDI) and Hamilton Depression Rating Scale (HAM-D), and one other study used the Center for Epidemiologic Studies Depression Scale (CES-D) (Appendix B). Other variables such as anxiety, substance abuse including alcohol, opioids and illicit drugs, cognitive impairment, suicidal ideation and attempts and quality of life were screened with various instruments. These instruments included the Generalized Anxiety Disorder 7-item (GAD-7), Mini-Mental State Examination (MMSE), Drug Abuse Screening Test 10-item (DAST-10), Short Michigan Alcoholism Screening Test (SMAST 13) and General Self-Efficacy (GSE) scale (Appendix A).

Although there was a degree of heterogeneity in the demographic characteristics, they were also homogenous. All studies included adults over the age of 18 without cognitive impairment or severe mental health (Appendix A). Their age ranged from 18 to 87 years old with mean age ranging from 41 to 61 (Appendix B). The majority of the studies included both men and women with the exception of one that was 100% male (Appendix B). All samples included a diverse population of insured, uninsured, low levels of education, as well as some degree of education and different ethnic and racial backgrounds (Appendix A). Only three studies included

homelessness as part of their demographic data and 100% of the participants in one study were currently homeless (Appendix B).

Foundation of the Project

The evidence suggests the prevalence of depression is high among individuals from various racial and ethnic groups, social, economic and cultural backgrounds, as wells across the lifespan. It also suggests depression does not always present as a single problem but can be accompanied by other conditions such as anxiety and substance abuse, ultimately impacting overall health. Primary practice and community centers are important settings in unique situations to screen and identify individuals at risk with the utilization of efficient, cost-effective tools such as the PHQ-9 questionnaire. Once identified, numerous interventions such as education, counseling, exercise and medication can be implemented. This, along with a collaborative approach, significantly reduces depressive symptoms and improves health and overall quality of life. Based on the evidence an evidence-based practice (EBP) project was designed to change practice and answer clinical questions.

Theoretical Framework

The Theory of Unpleasant Symptoms (TOUS) was developed in 1990 and it was designed to integrate current knowledge about symptoms and highlight the commonalities and dimensions that have the potential to be useful in nursing practice and research (Smith & Liehr, 2014). The theory consists of three major concepts; symptoms, influencing factors and performance outcomes (Smith & Liehr, 2014). Symptoms are defined as unpleasant, occurring either in isolation or accompanied by other symptoms, and thus seen as the central part of the theory. Because they are often perception-based, this theory respectively focuses on individually perceived symptoms rather than observable signs (Smith & Liehr, 2014).

Influencing factors are identified as physiological, psychological and situational. Physiological factors include anatomical, genetic, illness-related and treatment related variables (Smith & Liehr, 2014). Psychological factors are more complex include affective and cognitive variables such as mood and emotional response to illness (Smith & Liehr, 2014). Lastly, situational factors include an individual's environment both social and physical including background, access to resources such as financial, emotional and instrumental help with symptom management (Smith & Liehr, 2014).

The final concept of performance represents the consequences of the symptoms. The experience of symptoms has an impact on the individual's ability to function physically, cognitively and in socially defined roles (Smith & Liehr, 2014). Symptoms are often indicators that an existing pathology is improving or worsening, and it is thought that the combination of multiple factors can significantly impact the symptom experience (Smith & Liehr, 2014). This theory has been identified as the theoretical framework for this project because homeless individuals often experience a variety of symptoms in relation to their medical and mental health. They are often deprived of necessary resources to reach and maintain good health and their outcomes often depend on their perception of symptoms, other physical conditions, psychological health and situational challenges (Appendix C).

Evidence-Based Practice Model

The Iowa model of evidenced-based practice has been chosen as guide to the implementation of this EBP project (Appendix D). The model contains six steps. The steps of this model include: identifying the problem; 2) determine its priority to organization; 3) search for evidence; 4) critically analyze and synthesize the evidence, determine its adequacy if not conduct another search; 5) develop and implement an EBP standard; 6) evaluate and disseminate

results to implement change (Brown, 2014). For this EBP project, inadequate health screening and access to healthcare have already been identified as being a problem. This has been acknowledged as a high priority for the organization with a need for change. An exhaustive search, critical analysis and synthesis of evidence has been performed. The next step is to conduct an EBP project which consists of piloting a screening intervention for depression, collecting and analyzing the data and disseminate the results, specifically for changing practice evidence by the adoption of the intervention by this organization.

Methods

Ethical considerations and human subject protection

Privacy and confidentiality. Prior to the implementation of this project, approval from Arizona State University's Institutional Review Board (IRB) was obtained to ensure human subjects protection. Privacy and confidentiality rights were discussed with each participant during the implementation. A written consent that explained the purpose of the project and their right to decline was given to each individual prior to data collection. A random number was given to each individual document in order to de-identify data and protect personal privacy. No data was collected on individuals who declined to participate, and an X was written on their paperwork simply to track how many individuals declined. All documents were stored in a locked cabinet in her office to ensure confidentiality and as part of her daily routine. A de-identified master list was collected and stored electronically, and password protected to ensure adequate data collection.

Description of population and setting. Project is taking place at a local non-profit organization located in the Phoenix metropolitan area. This organization has both men, women and children shelters; however, this intervention is only taking place at the men's facility. The

population mainly consists of homeless men from various ethnicities including Caucasian, African American, Native and Hispanic men between the ages of 18 and 73 years old. Participants will include all men seeking shelter in this organization and advancing to the Foundations program.

Project description. The project took place over a period of two months, early October until the end of November 2019. Convenience sampling was used, and sample size was dependent on the number of individuals admitted to the program.

Instrumentation, data collection and data analysis. In order to evaluate depression rate and severity, the PHQ-9 (Appendix E) will be the tool used. It is an instrument that can be used to screen, diagnose and monitor depression severity. It incorporates Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) diagnostic criteria for major depressive disorder and can also grade severity of depressive symptoms (Kroenke, Spitzer & Williams, 2001). It is self-administered and consists of nine questions rating symptoms on a four-point Likert scale, indicating frequency of symptom over the past two weeks as (0 = not at all, 1 = several days, 2 = more than half the days, 3 = nearly every day) for a total maximum score of 27 (Kroenke, Spitzer & Williams, 2001). Suicidal ideation and duration is assessed for in item number nine, and counts regardless of duration (Kroenke, Spitzer & Williams, 2001). No depression is suggested with a score of zero to four, five to nine indicates mild depression, ten to 14 moderate depression, 15 to 19 moderately severe depression, 20 to 27 indicates severe depression (Kroenke, Spitzer & Williams, 2001).

The PHQ-9 has been validated as a screening test in a variety of studies including the general population, primary care settings and other specific disease populations (Shin, Lee, Han, Yoon, & Han, 2019). The diagnostic validity of the PHQ-9 was established in a study involving

eight primary care and seven obstetrical clinics (Kroenke, Spitzer & Williams, 2001). Scores greater than ten had a sensitivity of 88% and a specificity of 88% to detect Major Depressive Disorder (Kroenke, Spitzer & Williams, 2001). Reliability and validity of the tool have indicated it has rigorous psychometric properties with an internal consistency ($\alpha = 0.89$) in the primary care group and ($\alpha = 0.86$) Ob-Gyn group (Kroenke, Spitzer & Williams, 2001). Test-retest reliability was excellent with a correlation between the PHQ-9 completed by the patient in the clinic and the one administered telephonically within 48 hours at $r = 0.84$ (Kroenke, Spitzer & Williams, 2001).

Chart audits are used as methods of data collection for a variety of different studies regarding incidence, prevalence, clinical course, prognosis of conditions and outcomes of health services (Uttam et al., 2018). They are often utilized to answer clinical questions, determine adherence to guidelines or standards of practice (Uttam et al., 2018). It has become a well-accepted method and applied in a variety of healthcare disciplines such as epidemiology, quality assessment, professional education, residency training, inpatient care, clinical research and serve a variety of purposes (Uttam et al., 2018). Data can be individualized in various ways and directly linked to the electronical medical health record, making them a valuable tool for clinical practice.

For the purpose of this project, a chart audit form was used to gather pertinent information to measure outcomes (Appendix F). This form collected important sociodemographic information such as age, gender, ethnicity, level of education and whether the individual is insured or uninsured. To identify the referral timeframe, the date of initial PHQ-9 screening, date when social worker received and submitted referral to primary care practice, date of scheduled appointment and whether depression was diagnosed by primary care provider was

collected. Data analysis was used using Intellectus and descriptive and inferential statistics performed.

Budget and funding. No funding was required or utilized for this project. Total expected budget was estimated at $24,487.04 (Appendix G). This included the preparation stage included designing education material, consent forms, project outline costs as well as equipment needed for that such as the computer. A room will need to be used to meet with the team and discuss project details and individual roles. During the delivery stage, a room will need to be utilized to conduct the depression screening process. It will also include other indirect costs such as general office supplies required to fill out questionnaires and keep track of information. Other costs such as the salaries individuals directly involved in the project include the social worker who will be coordinating referrals and keeping track of resident progress, intake staff who will be delivering project information, consent forms and PHQ-9 questionnaires, as well as student time who will be continuously monitoring project progress.

Utilizing student's own laptop for project development removed equipment cost. Utilizing the organization's current building and rooms will also allow for indirect cost savings. Making changes to the social worker and intake team's workflow and allowing them to incorporate screening tools and referrals into their daily routine will help deduct additional salary costs. DNP student will be donating her time to the development of this project and throughout the stages of preparation, delivery and evaluation which will allow for further cost savings. Potential sources of funding could include writing a grant to help with overall costs of supplies and equipment. However, this organization is willing to donate their time and resources for the development of this project and overall improvement of health for their residents. This yielded a final estimated budget of $1,187.04 (Appendix H).

Results

A total of 31 individuals were asked to participate in this project. Final sample size was (*N* = 18) and 100% were male. The most frequently observed category of race/ethnicity was White Non-Hispanic (*n* = 6, 33%), followed by Hispanic (*n* = 4, 22%), American Indian (*n* = 2, 11%), Asian/ Pacific Islander (*n* = 2, 11%), Black non-Hispanic (*n* = 1, 6%), Hispanic/Pacific Islander (*n* = 1, 6%) and those who failed to answer that question (*n* = 2, 11%). The most frequently observed category of level of education was high school diploma (*n* = 8, 44%). This was followed by less than high school (*n* = 4, 22%), some college (*n* = 3, 17%), bachelor's (*n* = 1, 6%). Two individuals failed to answer this question (*n* = 2, 11%). The most frequently observed category of insured was Yes (*n* = 14, 78%) and No (*n* = 4, 22%). The participants age had an average of 35.50 (SD = 11.39, SEM = 2.69, Min = 21.00, Max = 62.00, Skewness = 0.87, Kurtosis = 0.22).

When analyzing the questions of the PHQ-9, the most frequently observed category of question 1; little interest or pleasure in doing things was not at all (*n* = 9, 50%). The most frequently observed category of question 2; feeling down, depressed, or hopeless was not at all (*n* = 9, 50%). The most frequently observed categories for question 3; trouble falling or staying asleep or sleeping too much were nearly every day, not at all, and several days, each with an observed frequency of 6 (33%). The most frequently observed category for question 4; feeling tired or having little energy was not at all (*n* = 9, 50%). The most frequently observed category for question 5; poor appetite or overeating was not at all (*n* = 10, 56%).

The most frequently observed category for question 6; feeling bad about yourself was more than half the days (*n* = 6, 33%). The most frequently observed category for question 7; trouble concentrating on things was not at all (*n* = 9, 50%). The most frequently observed

category for question 8; moving or speaking so slowly that people could have noticed, or the opposite was not at all (*n* = 10, 56%). The most frequently observed category for question 9; thoughts that you would be better off dead was not at all (*n* = 10, 56%). The most frequently observed category for question 10; if you checked off any problems how difficult have these problems made it for you to work, take care of things at home or get along with other people was, not difficult at all (*n* = 12, 67%). The observations for total score was an average of 7.72 (SD = 4.69, SEM = 1.10, Min = 1.00, Max = 16.00, Skewness = 0.30, Kurtosis = -1.07).

The most frequently observed category of severity was mild (*n* = 7, 39%). This was followed by none – minimal (*n* = 5, 28%), moderate (*n* = 4, 22%) and moderately severe (*n* = 2, 11%). A Spearman correlation analysis was conducted between previously diagnosed and depression severity. The correlations were examined based on an alpha value of 0.05 (*p* = 0.05). A significant positive correlation was observed between previously diagnosed and depression severity (r_s = 0.63, *p* = .005). The correlation coefficient between previously diagnosed and depression severity was 0.63, indicating a large effect size. This correlation indicates that as individuals are previously diagnosed, depression severity tends to be increased. A Pearson correlation analysis was conducted between total score and age. Cohen's standard was used to evaluate the strength of the relationship. The correlations were examined based on an alpha value of 0.05 (*p* = 0.05). There were no significant correlations between any of the variables (r_p = 0.05, *p* = .843) (For full list of tables and figures, see Appendix I).

Project Impact

Patient. The implementation of this project successfully identified individuals at risk for depression as well as those already suffering with depression. This resulted in a faster referral to primary care to address mental and physical needs.

Provider. This project focused on increasing the screening at this facility and did not follow any providers.

System. Allowed this organization to implement an intervention that led to identification of individuals with depression. Consequently, they were able to promptly refer individuals to primary care, leading to faster access to healthcare.

Policy. Currently there no policy to routinely screen for depression at this facility.

Project sustainability. This project utilizes the PHQ-9 which is a free tool that can be utilized to screen and monitor depression. The intervention was purposely implemented so that it would not create additional work for current staff or cost to the organization. Routine screening for depression can be sustained by making it a part of the intake process as individuals are admitted to the Foundations program. Combining depression referrals with routine medical referrals could be an efficient way sustain this intervention.

Discussion

According to the results, most individuals presented with an average score indicative of mild depression. Some participants presented with moderate and moderately severe depression scores. This is clinically significant because recommendations for mild depression scores include monitoring and follow up. For those individuals with higher depression scores, follow up and treatment must be implemented to promote better health outcomes. There was a significant correlation between a previous diagnosis of depression and depression severity. This is important because it corroborates the validity of the PHQ-9 and the reasoning for utilizing it for the purpose of this project. An additional analysis was done to determine if depression severity was more prevalent based on age. The results did not find a significant correlation meaning that

depression severity does not vary across ages and addressing depression and its symptoms is important for all individuals.

Limitations

This project included several limitations. One limitation of the study included working with a small staff team of two individuals, thus limiting the number of potential participants and referrals. Additionally, these two individuals do not have a medical background leading to lack of understanding regarding depression, screening and other helpful interventions. In addition, individuals were only screened and referred if proposed criteria were met, leaving out opportunities to reach other high-risk individuals. For those who met criteria, once referred, the attention to PHQ-9 varied among providers and physical complaints were often prioritized. Access to healthcare was limited to one particular organization, eliminating potential collaboration with other clinics and expanded access to care.

Recommendations

The findings of this project correlate with current literature and demonstrate that using valid and reliable tools such as the PHQ-9 can be an effective tool to identify depression in adults. The implementation of routine screening in the homeless population can help identify the rate of individuals suffering this condition and lead to prompt referrals. This can lead to faster access to healthcare, prompt treatment, improved mental and physical health leading to overall well-being and functioning. Depression screening in homeless shelters presents a unique opportunity to identify high risk individual and the data can be valuable to further explore the needs of this particular population.

Currently, there is not enough evidence regarding depression screening and outcomes specifically in the homeless population. This could be due to inability to reach individuals who

are not in homeless shelters. This project can be of significance in understanding how depression impacts those individuals experiencing homelessness. Future projects should focus on improving collaboration between this facility and healthcare providers, increasing the screening and ensuring timely referrals and appropriate follow up for those with positive symptoms of depression.

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Appendix A

Table 1

Evaluation Table

Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied	Measurement of Variables	Data Analysis	Findings	Decision for Use
Niemi et al. (2016). Community-based intervention for depression management at the primary care level in Ha Nam Province, Vietnam: a cluster-randomized controlled trial **Funding:** Swedish International	Inferred cognitive behavioral model	**Design:** CRCS from 6-2013 to 1-2014, pre and post-test interventions. **IG:** 11 communes **CG:** 10 communes 4 groups: **MND, MID, MOD, SED** **Inclusion:** pts 17 years and older at BLDH with somatic or psychological complaints. District had to adequately	**N:**1951 **n**: 1401 IG **n:** 550 CG **n:** 25 excluded based on incomplete PHQ-9. 1.3% attrition rate. **Setting:** 21 CHC, 1 district hospital. **Demographics:** 49.1% Females, 13 (38.2%) in IG, 11 (50.0%) in CG. 50.9% Males, 21 (61.8%) in IG, 11 (50.0%) in CG.	**IV1:** psychoeducation counseling for healthcare staff. **IV2:** Yoga training for nurses and physicians. **DV:** depression severity **YC:** 8-week workshop, one session per week.	PHQ-9 MINDI- Given to all individuals scoring MOD or SED for official diagnosis according to the DSM-IV criteria	Linear regression, Pearson chi-squares, independent sample t-tests, Mann–Whitney U test $p = 0.05$	76.6% MDN 19% MID 2.9% MOD 0.2% SED IG: 20.5% DEP, CG: 26% DEP, 34 MOD in IG, 22 MOD in CG, MA of DEP 64.5 years (SD 12.63), MA of NDP 60.3 (SD 14.67), DIA between depressed and NDP $p < 0.001$ **IV2:** Difference of DEP between IG and CG $P = 0.013$	**LOE:** Level I **Strengths:** PHQ-9 administered as an interview in case individual was illiterate. Prompt referral for severely depressed individuals. **Weaknesses:** weakness of the randomization procedure, resulting in unequal amounts of patients in the intervention and control groups. Does not examine long-term effects of intervention. **Harm feasibility:** Intervention was not

α - Cronbach's alpha value; **AI:** American Indian/Alaska Native; **ANOVA:** Analysis of variance; **BD**: Bipolar disorder; **BLDH:** Binh Luc district hospital; **CCM:** Chronic care model; **CCO:** clinical cut-off point; **CES-D:** Center for Epidemiologic Studies Depression; **CG:** control group; **CH:** Currently homeless; **CHC:** community health centers; **COL:** College; **CRCS:** Cluster-randomized controlled superiority trial; **DAST-10:** Drug Abuse Screening Test 10-item; **DEP:** depression; **DIA:** difference in age; **DIG**: difference in gender; **DSM-IV:** Diagnostic and statistical manual of mental disorders; **DV:** dependent variable; **DX:** diagnosed/diagnosis; **EMP:** employed; **FMHX:** Family history of mental health issues; **G1**: usual care; **G2:** UC and psychotherapy; **G3:** UC and education; **G4:** UC, psychotherapy, and education; **GAD-7**; Generalized Anxiety Disorder 7-item; **GSE**: General Self-Efficacy scale; **HIS:** Hispanic/Latino; **HS:** high school or less; **HTN:** hypertension; **HX:** history; **IG:** intervention group; **IV:** independent variable; **Key**: **AA**: African Americans; **LOE:** level of evidence; **M:** mean; **MA:** mean age; **MDC:** Medicaid; **MED:** median; **MID:** mildly depressed score 5-9; **MIL:** Military issue; **MINDI:** Mini-International Neuropsychiatric Diagnostic Interview; **MMSE:** Mini mental state exam; **MND:** minimally depressed score less than 4; **MOD:** moderately depressed score 10-19; **NC:** income; **NDMD:** non-depressed/minimally depressed; **NDMHC:** Never discussed mental health concerns with professional; **NDP:** non-depressed patients; **NI:** No insurance; **p:** significance; **PDMHWP**: Previously discussed mental health care concerns with a professional; **PHQ-9:** Patient health questionnaire 9 item; **PI:** Private insurance; **PRIME-MD:** Primary Care Evaluation of Mental Disorders; **RPA:** receiving public assistance; **RRD:** Red river delta geographical area **SD:** standard deviation; **SED:** severely depressed score greater than 20; **SI:** suicidal ideation; **SMAST 13**: Short Michigan Alcoholism Screening Test; **TX:** treatment; **UC:** Usual care; **UMD:** unipolar major depression; **UNE:** unemployed; **Vet:** Veteran; **YC:** yoga course.

Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied	Measurement of Variables	Data Analysis	Findings	Decision for Use
Development Cooperation Agency. **Bias:** none recognized **Country:** Vietnam		represent RRD and have a psychiatric hospital in area. **Exclusion:** psychotic, active infection, impaired consciousness or emergency cases. **Purpose:** evaluate the effectiveness of a collaborative community-based intervention including psychoeducation and yoga for depression management in primary care.	Age: 17- 96 M age of 61.3 years (SD 14.27)				difference in PHQ-9 scores after the 8th week between IG and CG $p < 0.001$ DIA p=0.49, DIG p=0.10 Med PHQ-9 before and after intervention 12.5 and 4 in IG p<0.001, CG score decreased 2 points.	harmful to any individuals, results improved depression scores. **PICOT applicability:** Study conducted in a community setting and can be applicable to other populations. It shows good reliability of PHQ-9 screening tool in identifying and managing patients with depression. Demonstrates added interventions to standard care promote better outcomes of depressive symptoms.
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Variables Studied**	**Measurement of Variables**	**Data Analysis**	**Findings**	**Decision for Use**

Key:α - Cronbach's alpha value; **AA**: African Americans; **AI:** American Indian/Alaska Native; **ANOVA:** Analysis of variance; **BD**: Bipolar disorder; **BLDH:** Binh Luc hospital; **CCM:** Chronic care model; **CCO:** clinical cut-off point; **CES-D:** Center for Epidemiologic Studies Depression; **CG:** control group; **CH:** Currently homeless; **CHC:** community health centers; **COL:** College; **CRCS:** Cluster-randomized controlled superiority trial; **DAST-10:** Drug Abuse Screening Test 10-item; **DEP:** depression; **DIA:** difference in age; **DIG**: difference in gender; **DSM-IV:** Diagnostic and statistical manual of mental disorders; **DV:** dependent variable; **DX:** diagnosed/diagnosis; **EMP:** employed; **FMHX:** Family history of mental health issues; **G1**: usual care; **G2:** UC and psychotherapy; **G3:** UC and education; **G4:** UC, psychotherapy, and education; **GAD-7**; Generalized Anxiety Disorder 7-item; **GSE**: General Self-Efficacy scale; **HIS:** Hispanic/Latino; **HS:** high school or less; **HTN:** hypertension; **HX:** history; **IG:** intervention group; **IV:** independent variable; **LOE:** level of evidence; **M:** mean; **MA:** mean age; **MDC:** Medicaid; **MED:** median; **MID:** mildly depressed score 5-9; **MIL:** Military issue; **MINDI:** Mini-International Neuropsychiatric Diagnostic Interview; **MMSE:** Mini mental state exam; **MND:** minimally depressed score less than 4; **MOD:** moderately depressed score 10-19; **NC:** income; **NDMD:** non-depressed/minimally depressed; **NDMHC:** Never discussed mental health concerns with professional; **NDP:** non-depressed patients; **NI:** No insurance; **p:** significance; **PDMHWP**: Previously discussed mental health care concerns with a professional; **PHQ-9:** Patient health questionnaire 9 item; **PI:** Private insurance; **PRIME-MD:** Primary Care Evaluation of Mental Disorders; **RPA:** receiving public assistance; **RRD:** Red river delta geographical area **SD:** standard deviation; **SED:** severely depressed score greater than 20; **SI:** suicidal ideation; **SMAST 13**: Short Michigan Alcoholism Screening Test; **TX:** treatment; **UC:** Usual care; **UMD:** unipolar major depression; **UNE:** unemployed; **Vet:** Veteran; **YC:** yoga course.

Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied	Measurement of Variables	Data Analysis	Findings	Decision for Use
Opperman et al. (2017). Depression screening at a community health fair: Descriptives and treatment linkage. **Funding:** none identified **Bias:** none stated or identified **Country:** United States	Inferred chronic care model	**Design:** retrospective study **Inclusion:** all men in a community health fair **Exclusion:** none **Purpose:** Explore demographic and depressive symptom associations with participants, and examine rates of immediate treatment linkage with an on-site clinician, as well as treatment linkage to follow-up mental health services.	**N**=261 **Setting:** Men's health fair in a large city. **Demographics:** Males, 18-87 years of age, M=51.23; SD=13.18 n = 65 Caucasians 24.9%, n = 169 AA 64.8%, n =1, 0.4% AI, n = 8, 3.1% Asian, n = 3, 1.1% other, n = 9, 3.4% mixed HIS: n =6, 2.3% Vet n = 47, 18.0%, NI n = 85, 32.6%, PI n = 118, 45.2%, MDC n = 27, 10.3%, MIL n = 9, 3.4%, CH n = 14, 5.4%,	**IV** = depression screening, **DV**= depression	12-item demographic questionnaire PHQ-9 (α= 0.87)	One-way ANOVA, Independent groups t-tests, chi square	**n:** 67 CCO 10 indicating MOD, n=27 NDMHC, n: 24 met with psychiatric nurse, n=194 below CCO of 10. One-way ANOVA no significant differences between demographic variables and depressive symptoms. CH p=0.02, RPA p<0.001, PDMHWP p<0.001, FMHX p<0.001 self-reported greater severity of depressive symptoms	**LOE:** Level II **Strengths:** Adequate screening, onsite psychiatric nurse, encouraged mental health follow up. **Weaknesses:** Patients did not follow up with mental health after six months. Lack of control group. Low applicability due to specific low-income sample. **Harm feasibility:** individuals were not harmed by the intervention, it was non-invasive. **PICOT applicability**: Sample was representative of low income, uninsured ethnic groups and applicable to selected population.

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			NDMHC n = 163, 62.5%, FMHX n = 95, 36.4%					
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Variables Studied**	**Measurement of Variables**	**Data Analysis**	**Findings**	**Decision for Use**
Meyers et al. (2014). Depression screening and treatment in uninsured urban patients **Funding:** partially funded by Blue Cross Blue Shield Foundation of Michigan **Bias:** None declared **Country:** United States	Inferred Chronic Care Model	**Design:** Prospective repeated-measures design, re-evaluated at 8,12 and 24 weeks. **4 groups:** G1, G2, G3 and G4 **Inclusion:** patients previously diagnosed with DEP and/or who were not receiving any form of treatment for DEP. **Exclusion:** previously DX	**N:** 674 **n:** 255 DEP n: 49 dropped from study. 7.3% attrition. **Setting:** Primary care clinic 8/2005 to 8/2007 and 2/2009 to 9/2010. **Demographics**: Age 18-64, n = 314 (31.8%) less than 45, 360 (68.2%) greater than 45. n = 641 (95.1%) AA, n = 33 (4.9%) other, n = 448 (66.5%) F, n = 226 (33.5%) male,	**IV1:** Treatment intervention **IV2:** Time **DV:** PHQ-9 depression score	PRIME-MD and PHQ-9	Test of proportions, repeated-measures ANOVA, p <0.05	**N=** 412 (61.1%) PHQ-9 score ≥5, n = 255 dx with DEP. IV2: All groups reduction in DV in 6 months with mean score of 15 at baseline to 8.3 *p*<0.001. G2, G2 and G4 did not show additional, significant reduction of DV.	**LOE:** Level II **Strengths:** Large size, PHQ-9 proved to be an adequate tool to screen for depression vs standard care. All groups regardless of intervention had significant reduction in depressive symptoms after 24 weeks. **Weaknesses:** Study only followed short-term outcomes. Additional interventions such as psychotherapy and education were not adequately measured. Not all patients took advantage of free psychotherapy

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied	Measurement of Variables	Data Analysis	Findings	Decision for Use
		with DEP and receiving TX, hx of mental illness **Purpose:** To determine if formal screening increases the identification of depression in low-income patients in primary care settings determine if identification and treatment lower depression scores and to determine the most effective depression intervention for low-income patients in primary care settings	n = 432 (64%) HS, n = 242 (35.9%) Col, n = 594 (88.1%) INC $20,000 n = 340 (50.4%) UNE, n = 334 (49.6%) EMP.					perhaps skewing the results. No control group. **Harm feasibility:** individuals were not harmed by the intervention, it was non-invasive. **PICOT applicability**: This can be applicable to homeless populations. PHQ-9 is a reliable, cost-effective tool for diagnosis of depression in this population. This study shows the importance of active screening and prompt treatment to promote better outcomes.

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Kilbourne et al. (2019). Randomized controlled trial of a collaborative care intervention for mood disorders by a national commercial health plan. **Funding:** New Harbinger Publishing and Springer. **Bias:** None stated or identified. **Country:** United States.	Collaborative Chronic Care Model	**Design:** single-blind, randomized controlled trial. 2 groups: CCM, UC. **Inclusion:** Aetna patients, 21 and older, hospitalized 6 months prior with UMD or BD (bipolar manic or depressed state) **Exclusion:** no longer enrolled in Aetna health plan, deceased, or unable to provide informed consent due to an unstable condition,	**N:** 238 n:115 CCM, n:123 UC. **Setting:** Primary care clinics and remote care via telephone calls. **Demographics:** MA of 41.36 31.1; were mostly female (66%), white (81%), and employed (58%);	**IV:** Depression symptoms **IV2:** Mental-health quality of life **CCM:** contacts and psychosocial intervention (10 self-management sessions, ongoing care management).	Patient Health Questionnaire (PHQ-9), 12-item Short-Form (SF-12) Health-Related Quality of Life Survey	Mixed effects models, multivariable logistic regression, Cohen's d,	**N73:** Final, **n:**165 dropped out 69% attrition. Mean differences 27% PHQ-9 (Cohen's d=.25), 19% for SF-12 MCS (Cohen's d=.20). Adjusted mean PHQ-9 scores were lower by 2.34 points (95% confidence level [CL]=24.18 to –0.50, p=0.01), indicating improved symptoms, and mean SF-12 mental health	**LOE:** Level II **Strengths:** Effective in reducing depressive symptoms and improving health-related quality of life for individuals with mood disorders. **Weaknesses:** Only a small number of eligible patients enrolled, possibly due to hesitance of a program offered by an insurer instead of care provider. Post randomization drop out was great due to losing Aetna coverage. Case manager was not present and unable to address pharmacotherapy concerns. **Harm Feasibility:** Individuals were not harmed; study was noninvasive and promoted better health outcomes.

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		inpatient status, or inability to speak English. **Purpose:** To determine if a CCM in a U.S. health plan improved 12-month outcomes among those with mood disorders compared with usual care.					scores were higher by 3.21 points (CL= –.97 to 7.38, p=0.10), indicating better quality of life, among participants receiving CCM versus usual care.	**PICOT applicability:** Study can be applicable to homeless population utilizing the same tool. It shows the importance of integrated collaborative care and how it can be more successful than standard care alone for treatment of depression and other mental health problems. It showed potential for cost-efficient approach to providing evidence-based care remotely to patients.
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Variables Studied**	**Measurement of Variables**	**Data Analysis**	**Findings**	**Decision for Use**
Lee et al. (2017). Mental health, substance abuse, and suicide among homeless adults. **Funding:** supported by the U.S. Agency for	Inferred Cognitive Behavioral Model	**Design:** Cross-sectional, purposive and convenience sampling **Inclusion:** Age 18 or over in homeless shelters, willing to participate	**N:** 156 **Setting:** homeless adults in 7 shelters in Kansas **Demographics:** 19 to 72 years if age with a MA 41 years; 66% male, 61.9% of the respondents	**DV:** Measure the suicidal ideation and suicide attempts of homeless individuals. **IV1:** Depressive symptoms	2 questions: Have you ever thought of committing suicide? and (2) Have you ever attempted to commit suicide?	IBM SPSS, univariate descriptive Statistics, correlation matrix, logistic regression	41% had suicidal thoughts and 21.6% previously attempted suicide. Drug abusers likely vs non-drug abusers to have	**LOE:** Level II **Strengths:** Good sample size. Adequate randomization. Good information regarding the importance of mental health in regard to anxiety, depression and substance abuse.

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Healthcare Research and Quality (AHRQ) (R18 HS 21425). **Bias:** none identified **Country:** United States		and no known severe cognitive impairment **Exclusion:** no exclusion criteria specified. **Purpose:** To explore the roles of mental health and substance abuse problems on suicidal ideation and suicide attempts among this population	were Caucasian, 17.4% AA. 17.8% employed. 29.2% sexual/physical abuse.	**IV2:** anxiety **IV3:** Drug abuse **IV4:** alcohol abuse **IV5:** socio-psychological and demographic variable.	CES-D scale, GAD-7, DAST-10, SMAST-13, GSE		SI (B = .217, p ≤ .05, Odds Ratio = 1.243). Anxiety were more likely vs non-anxiety to have SI (B = .153, p ≤ .05, Odds Ratio = 1.165) and suicide attempts (B = .274, p ≤ .001, Odds Ratio = 1.316). Employed less likely to have SI (B = –1.734, p ≤ .05, Odds Ratio = .177). Hx of sexual abuse (B = 1.288, p ≤ .05, Odds Ratio = 3.626) and suicide attempts	**Weakness:** use of non-probability sampling. Did not study long term effects of the impact of mental health problems and substance abuse on suicidal ideation and suicide attempts among homeless people. **Harm Feasibility:** Individuals were not harmed; study was noninvasive and promoted better health outcomes. **PICOT applicability:** Study explores the importance of screening for depression in the homeless population. It adequately links depression and anxiety with substance abuse and socio-psychological effects such as suicide ideation and attempts.

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							(B=1.554, p ≤ .05, Odds Ratio = 4.726).	
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Variables Studied**	**Measurement of Variables**	**Data Analysis**	**Findings**	**Decision for Use**
McClintock et al. (2017). Incorporating patients' social determinants of health into hypertension and depression care: A pilot randomized controlled trial. **Funding:** Agency for Healthcare Research and Quality (Grant No. K18 HS23445). **Bias:** The authors deny any conflict of interest.	Inferred Chronic Care Model	**Design:** two phases: a 2-week run-in phase and a randomized controlled trial phase. **Inclusion:**18 and older, diagnosis of HTN and, a current prescription for an antihypertensive. **Exclusion:** Inability to give informed consent, significant cognitive	**N: 54** **N:**1 person dropped **Setting:** three primary care practices **Demographics:** MA 60, Basic intervention AA 13 (52%), Caucasian 9 (12%), depression SD 6.3. Enhanced intervention AA 19 (65.5%), Caucasian 7 (24.1%), depression SD 6.9	**DV1:** Blood pressure **DV2:** Depressive symptoms **IV1:** Enhanced intervention-Basic plus PPP **IV2:** Basic intervention-individualized program to improve adherence to antihypertensives and integration of depression treatment	Electronic monitor, PHQ-9, MMSE	*t* test and Fisher's exact test, variance–covariance matrix, standard deviation.	**1V1:** significantly improved systolic and diastolic BP mean from baseline vs pts in I**V2** 12 weeks (**IV1**: −11.96 vs. **IV2**: 6.08; p = 0.003), (**IV1:** −4.79 vs. **IV2:** 4.12; p = 0.019). **IV1:** significantly improved PHQ-9 from baseline vs **IV2** at 12 weeks (**IV1:** −2.75 vs. **IV2**	**LOE:** Level II **Strengths:** Randomized. Effectively explored social determinants of health into HTN and depression management. **Weaknesses:** Sample may not be truly representative due to only including three primary care clinics. Small sample size. **Harm Feasibility:** Study was non-invasive, no individuals were harmed during this study. PICOT Applicability: Homeless individuals struggle with a variety of social difficulties. Not many

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Country: United States		impairment at baseline (MMSE) < 21), residing in a care facility. **Purpose:** test the effectiveness of an integrated intervention for HTN and depression incorporating social determinants of health.		with HTN management.			0.40; p = 0.024).	studies have explored how social determinants of health impact individual health. This study is important in exploring not only depression, but the overall management of chronic health conditions in this population.
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Variables Studied**	**Measurement of Variables**	**Data Analysis**	**Findings**	**Decision for Use**
Feingold et al. (2018). The association between severity of depression and prescription opioid misuse among chronic pain patients with and without	Inferred Cognitive Behavioral	**Design:** Cross-sectional study **Purpose:** To explore rates of PO misuse among chronic pain patients with DEP and	**N**= 554 **Setting:** 2 large clinics in Israel participants were recruited over a 6-month period. **Demographics:** Females in Mild	**DV1:** opioid misuse **DV2**: mild **DV3:** moderate **DV4:** moderate-severe **DV5:** severe depression	Self-administered questionnaire: socio-demographic, substance use, pain indices (0-10 scale),	multinomial regression, Independent sample t-tests, multiple logistic regression analyses,	Individuals with DEP, were at increased risk t for opioid misuse (AOR) =3.63; 95% (CI)=1.71–7.7) vs those without DEP. Severity of DEP was	**LOE:** Level II **Strengths:** Good sample size. Showed a direct link between depression and risk of opioid abuse in individuals with chronic pain.

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anxiety: A cross-sectional study **Funding:** Indivior Pharmaceuticals **Bias:** Two of the authors declared no conflict of interest. Two authors disclosed receiving prior speaking fees from Indivior Pharmaceuticals. **Country:** Israel		according to level of severity. **Inclusion:** 18 and older, diagnosed with chronic and currently prescribed POs. **Exclusion:** not prescribed POs, cognitive impairment or language difficulties.	DEP 74 (52%), MOD 52 (51%), DEP mod-severe 60 (55%), severe 43 (46.2). Males mild DEP 69 (48.3%), MOD DEP 50 (49%), Mod-severe 49 (45%), severe 50 (53.8%).		COMM, PHQ-9, GAD-7.		strongly associated with increased risk for opioid misuse for moderate (AOR=3.71; 95% CI=1.01–13.76), moderate-severe (AOR=6.28; 95% CI=1.6–24.57) and severe (AOR=14.66; 95% CI=3.28–65.52) DEP, but those positive for mild DEP (AOR=1.49; 95% CI=0.39–5.68).	**Weaknesses: S**tudy did not use a standardized tool to screen for other substance abuse. It did not explore the amount and frequency of opioid abuse. **Harm Feasibility:** No individuals were harmed **PICOT Applicability:** Homeless individuals deal with a variety of chronic conditions, including pain. This study can be used to explore how severity of depression impacts substance misuse and overall health outcomes in this population.
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Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied	Measurement of Variables	Data Analysis	Findings	Decision for Use
Carey et al. (2014). Comparison of a single self-assessment item with the PHQ-9 for detecting depression in general practice. **Funding:** Beyond blue and the National Heart Foundation of Australia **Bias:** Authors deny conflict of interest **Country:** Australia	Inferred Cognitive Behavioral	**Design:** Cross-sectional survey presented on a touchscreen computer. **Purpose:** explore the utility of a single self-assessment item vs Patient Health Questionnaire (PHQ-9) at different thresholds. **Inclusion:** 18 and older, understood English, and presented to the doctor. **Exclusion:** Unable to give informed consent.	**N** =1004 **Setting**: 12 general practices in 3 urban regions, from two states within Australia. **Demographics:** Female 616 (61%), insured 197 (20%), 1–2 chronic diseases 407 (41%)	Depression	PHQ-9, single-item questionnaire	STATA 11.0, Frequencies, percentages, sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV), Clopper–Pearson method and post-hoc tests.	N = 1004 (61% female, 48% aged 55 years or older). With threshold of mild depression or greater, single item had adequate specificity (76%, 95% CI: 71–80%), 76 out 100 people non-depressed by the PHQ-9 were also not depressed by the single item. Sensitivity was high (91%, 95% CI: 84–95%), with the single item identifying 91 out of every	**LOE: II** **Strengths:** Large sample size. Self-administered tests to minimize bias or cueing of patient's depressive symptoms **Weaknesses:** Study did not involve a more structured interview. It only compared the effectiveness of two different screening tools for depression and not the condition itself. **Harm Feasibility:** None **PICOT Applicability:** This study shows that although a single-item approach may provide a quicker method of identifying individuals with possible depression, it is important to do a second assessment of depression to establish a diagnosis, identify false positives and to explore patient views.

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied	Measurement of Variables	Data Analysis	Findings	Decision for Use
							100 true cases (as defined by the PHQ-9).	
Citation	**Conceptual Framework**	**Design/Method**	**Sample/Setting**	**Variables Studied**	**Measurement of Variables**	**Data Analysis**	**Findings**	**Decision for Use**
Weobong et al. (2017). Sustained effectiveness and cost effectiveness of the Healthy Activity Programme, a brief psychological treatment for depression delivered by lay counsellors in primary care: 12-month follow-up of a randomised controlled trial **Funding:** Wellcome	Inferred Cognitive Behavioral	**Design:** parallel-arm, randomized controlled trial **Purpose:** Evaluate the sustained effectiveness and the cost effectiveness of HAP over 12 months and to assess whether behavioral activation reported by patients at 3 months mediated the effects of the intervention on depression at 12 months.	**N** = 495 n=248 EUC n= 245 to HAP plus EUC. n=2 lost to attrition (0.4%) **Setting:** 10 primary health centers India. **Demographics:** EUC group: MA 42.6, females 191 (77%), no education 55 (22%), unemployed 140 (56%). EUC plus HAP: MA 42.4, females 188 (76%), no education 75 (31%),	**DV1:** Depression severity, **DV2:** depression remission. **IV1:** EUC routine consult with physician, PHQ-9 results copies of a contextualized version of the WHO Mental Health Gap Action Programme (mhGAP) and information on when and where to refer for psychiatric care.	BDI-II, PHQ-9	Linear regression, logistic regression, marginal standardization, repeated measures analysis, receiver operated characteristic, *p*-values, adjusted prevalence ratio.	HAP maintained improved scores at 12 mons (difference in mean= −0.34; 95% CI −2.37, 1.69; p = 0.74), lower scores vs EUC alone (−4.45; 95% CI −7.26, −1.63; p = 0.002) and higher rates of remission (aPR = 1.36; 95% CI 1.15, 1.61; p < 0.009). Economic analyses indicated that	**LOE:** Level II **Strengths:** Large sample size. Randomized trial. **Weaknesses:** Limited checkpoints to assess possible remission or relapses. Patients were not diagnosed with PHQ-9 at baseline, it was only used to assess symptoms severity. Harm Feasibility: No individuals were harm during this study. **PICOT applicability:** This study shows the importance of collaborative, integrated programs in the management of depression. It also showed that

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied	Measurement of Variables	Data Analysis	Findings	Decision for Use
Trust Senior Research Fellowship grant **Bias:** DM has received money for lectures not related to this work. CGF holds a Principal Research Fellowship from the Wellcome Trust (046386). VP member of the Editorial Board of PLOS Medicine. All other authors declare no competing interests. **Country:** India		**Inclusion:** 18–65 years with a probable diagnosis of moderately severe to severe DEP. **Exclusion:** Pregnant women, severe medical conditions, hearing/speech difficulties.	unemployed 152 (62%).	**IV2:** EUC plus HAP behavioral program, 6–8 sessions, 30–40 minutes each.			HAP plus EUC was dominant over EUC alone, lower costs and better outcomes.	implemented interventions delivered by individuals other than physicians are effective and cost effective. In the homeless population, screening and utilizing community health workers can be an effective way to improve outcomes.

Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied	Measurement of Variables	Data Analysis	Findings	Decision for Use
Grelotti et al. (2017). Does substance use		**Design:** randomized controlled trial	**N=** 250 **Setting:** Homeless	**IG:** daily 20mg daily fluoxetine for	17-item Hamilton Rating Scale	Mixed effects linear regression,	Fluoxetine treatment on	**LOE:** Level II **Strengths: Large**

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied	Measurement of Variables	Data Analysis	Findings	Decision for Use
compromise depression treatment in persons with HIV? Findings from a randomized controlled trial. **Funding:** U.S. National Institutes of Health R01MH063011 **Bias:** Authors deny any conflict of interest. **Country:** United States		**Purpose:** Identify use of antidepressant treatment in depression with HIV and active substance abuse. **Inclusion:** English-speaking 18 and older, infected with HIV, living in San Francisco, CA, Major Depressive Disorder, Minor Depressive Disorder, or Dysthymia. **Exclusion:** On psychiatric meds within 3 months prior, receiving psychiatric care within 6 months prior, bipolar,	shelters, free lunch programs, low-income single-room-occupancy hotels, public HIV clinics, and social service agencies. **Demographics:** IG: MA 44.2 (SD = 9.09), female 6 (9.1%), homeless 45 (72.6%), alcohol use 33 (50%). Control: MA 42.8 (SD= 8.44), female 8 (11.3%), homeless 45 (64.5%), alcohol use 38 (54%).	2 weeks, followed by once-weekly 22 weeks, self-administered once-weekly for another 3 months. **CG:** Psychiatric care and possible medication regimen.	for Depression (HAMD) and Beck Depression Inventory (BDI), self-report of any alcohol, crack, cocaine, heroin, or methampheta mine.	mixed-effects Poisson regression, standard deviation.	DEP severity relative to community referral was statistically significant irrespective of alcohol use. Effect size 1.76/5.4 = 0.33 for alcohol and 2.34/5.4 = 0.43 for those who did not use alcohol. BDI, the effect sizes larger: 3.95/9.7 = 0.41 alcohol and 6.45/9.7 = 0.66 no alcohol. Alcohol use days was 0.56 (95% CI: 0.20 to 1.58; p = .276). Incident rate ratio for	**Weaknesses:** Study was not a blinded randomized trial. Study did not evaluate the effect of specific drugs in relation to depression. Study was focused on depression rather than substance abuse; therefore, it did not assess the extent of illicit drug use on depression. **Harm Feasibility**: None **PICOT Applicability:** Study focuses largely on individuals with depression and homelessness. This shows the importance that untreated depression can have on chronic disease and overall health outcomes.

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Citation	Conceptual Framework	Design/Method	Sample/Setting	Variables Studied	Measurement of Variables	Data Analysis	Findings	Decision for Use
		psychotic disorder, or dementia, substance use or suicidal ideation.					illicit drug use days was 0.66 (95% CI: 0.17 to 2.60; p = .548).	

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Appendix B

Table 2

Synthesis Table

Author	Carey et al.	Feingold et al.	Grelotti et al.	Kilbourne et al.	Lee et al.	McClintock et al.	Meyers et al.	Niemi et al.	Opperman et al.	Weobong et al.
Year	2014	2018	2017	2019	2017	2017	2014	2016	2016	2017
Country	Australia	Israel	US	US	US	US	US	Vietnam	US	India
Level of significance	II	II	II	II	II	II	II	I	II	II
Design	Cross-sectional	Cross-sectional	RCT	Single blind RCT	Cross-sectional	RCT	Prospective	CRCS	Retrospective	RCT
Sample size	1004	554	250	238	156	54	674	1951	261	495
Setting										
Primary Care	X	X		X		X	X	X		X
Community			X		X				X	
Independent variables										
DS	X	X	X	X	X	X	X	X	X	X
Education			X	X			X	X		X
Dependent variables										
DSEV	X	X	X	X	X	X	X	X	X	X
Instruments										
PHQ-9	X	X		X		X	X	X	X	X
BDI			X							X
HAM-D			X							
CES-D					X					
Demographics										
Males	39%	52%	79.6%	44%	44%	60%	33.5%	50.9%	100%	24%
Females	61%	48%	20.4%	66%	66%	40%	66.5%	49.1%	0	76%
Homeless	NA	NA	67%	NA	100%	NA	NA	NA	5.4%	NA
Mean Age	55	NA	43	41	41	61	44	61	51	NA
Findings										
ID depression	X	X	X	X	X	X	X	X	X	X

Key: BDI: Beck depression inventory; **CES-D:** Center for epidemiologic studies depression scale; **CRCS:** Cluster-randomized controlled superiority trial; **DS:** Depression Screening; **DSev:** Depression severity; **HAM-D:** Hamilton depression rating scale; **ID:** Identify; **NA:** Not measured/ Not Applicable; **PHQ-9:** Patient health questionnaire 9-item; **RCT:** Randomized controlled trial.

Appendix C

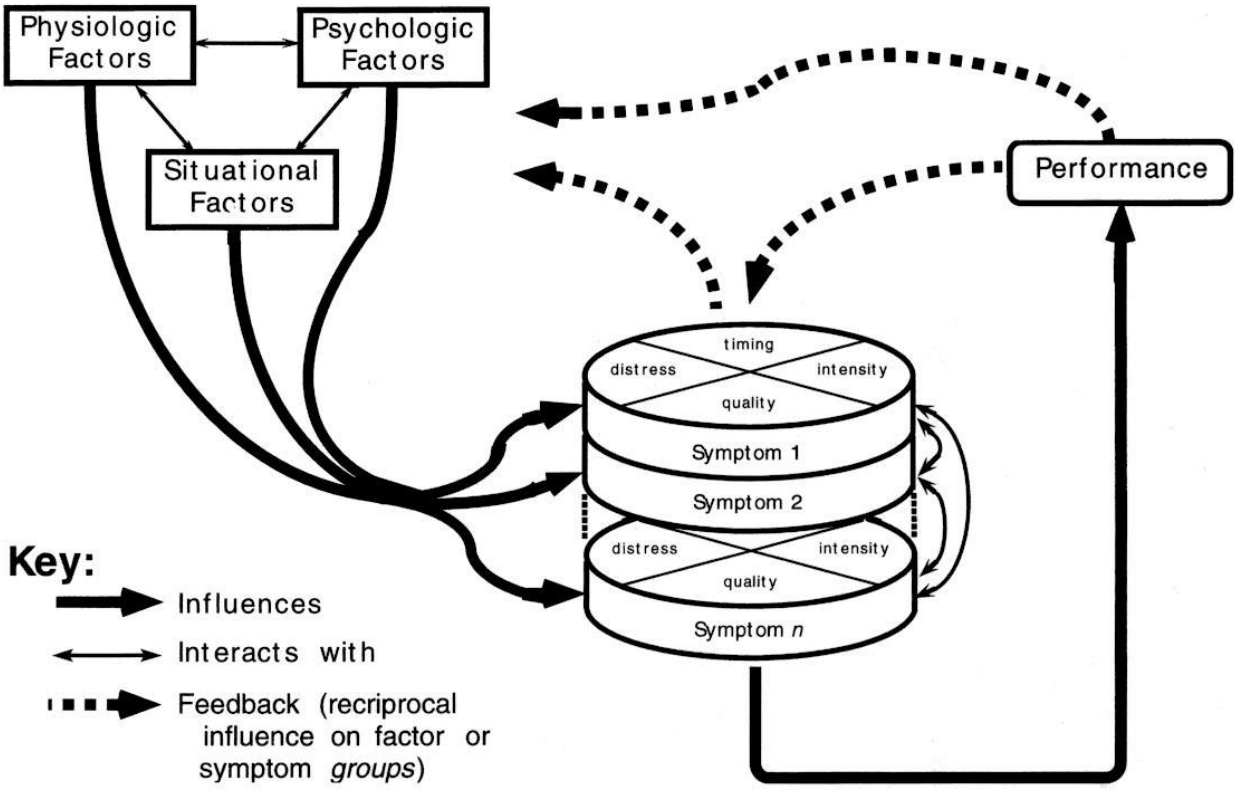


Figure 1. Theory of Unpleasant Symptoms. Adapted from *Middle range theory for nursing* (170), by M. J. Smith & P. R. Lier. 2014, New York, NY: Springer Publishing Company.

Appendix D

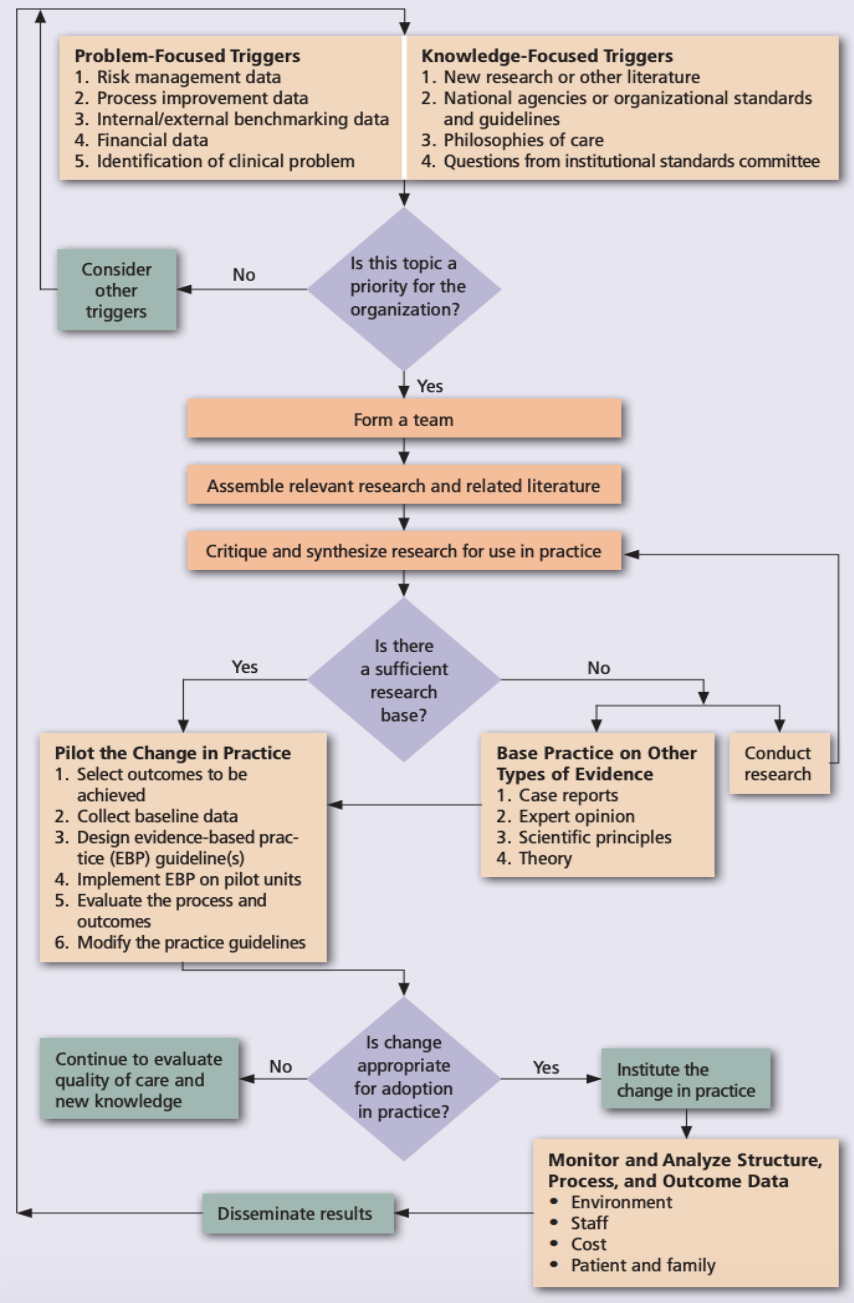
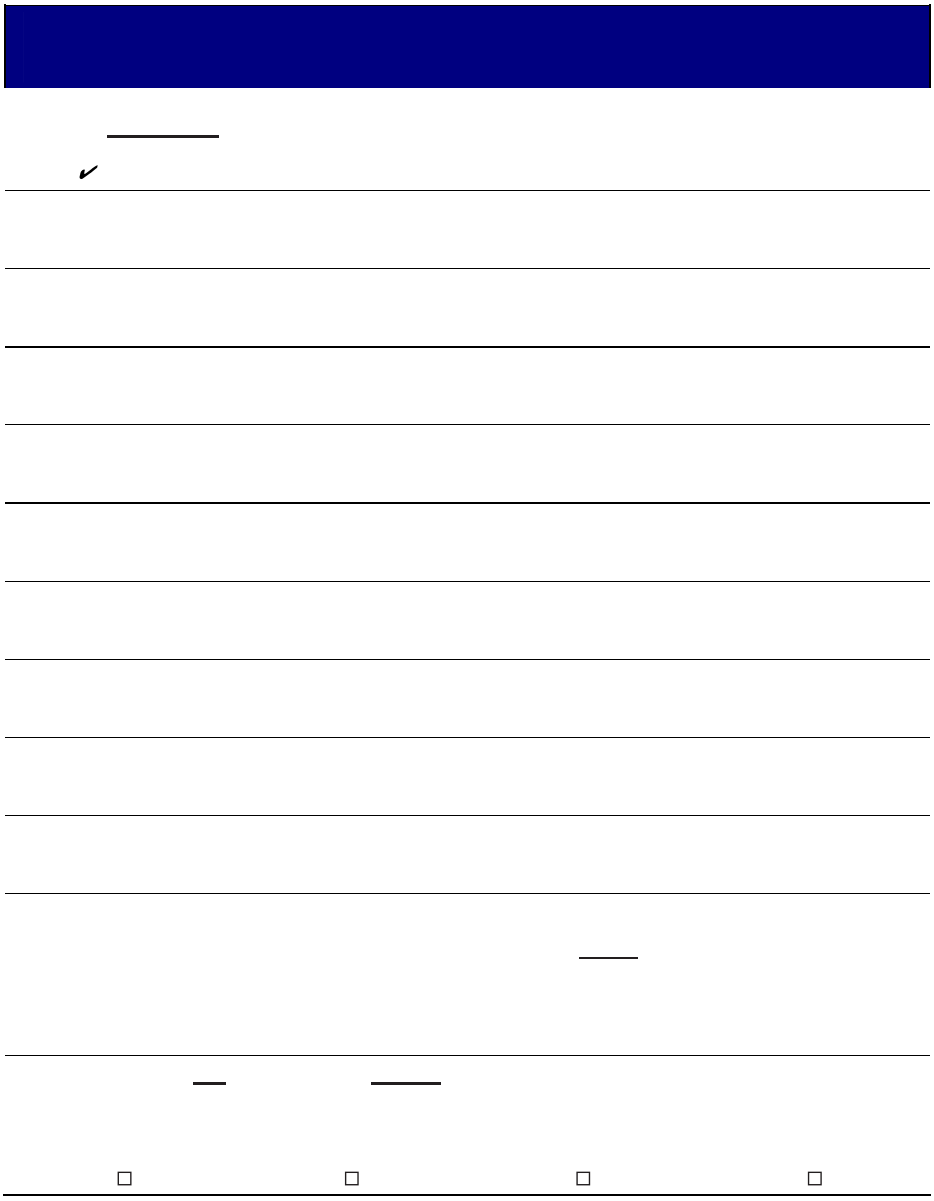


Figure 2. Iowa Model of Evidence-Based Practice. Adapted from "Perioperative nursing leaders implement clinical practice guidelines using the Iowa Model of Evidence-Based Practice," by S. White, AORN Journal, 102(1), 50-59.

Appendix E



Appendix F

Demographic Form

Demographic Form						
ID Number	**Age**	**Gender**	**Race/Ethnicity**	**Level of Education**	**Insured**	**PHQ-9 Completion Date**
			□ Black non-Hispanic □ American Indian □ Hispanic □ Asian/Pacific Islander White non-Hispanic	□ Less than high school □ high school diploma □ Some college □ Bachelors □ Graduate	YES NO	

Appendix G

Expected Budget

Phase	Activities	Cost	subtotal	Total
Preparation	Design and print 2 recruitment letters and 2 letters of support **(direct)**	$0.56 each	**$2.24**	
	Design and print 200 demographic worksheets, 200 consent forms and 200 PHQ-9 questionnaires **(direct)**	$0.28 each	**$168.00**	
	Design and print 30 step-by-step process of how project will run, available mental health resources (numbers, addresses) and individual responsibilities **(direct)**	$0.56 each	**$16.80**	
	Laptop computer for education development **(direct)**	$1200	**$1200**	
	Room rental for project planning and education of staff **(indirect)**	$1000 per month	**$1000 for 1month**	
Delivery	Room rental for intake use and depression screening process **(indirect)**	$1000 per month	**$4000 For 4 months**	
	General cost of utilities for rental rooms **(indirect)**	$200 Per month	**$800 For 4 months**	
	General office supplies (pens, pencils, highlighters, clipboards) **(indirect)**	$50 Per month	**$200 For 4 months**	
	Social worker time **(indirect)**	$25 per hour	**$1,500 60 hours**	
	Intake team staff time (4 people) **(indirect)**	$20 per hour	**$4,800 60 hours each**	
	DNP student time **(indirect)**	$40 per hour	**$10,000 250 hours**	
Evaluation	Review and analyze DNP project results **(indirect)**	$40 per hour	**$800 20 hours**	**$24,487.04**

Appendix H

Cost Savings

Total Expected Budget	**Cost Savings**	**Final Expected Budget**
$24,487.04		
Laptop computer for education development **(direct)**	- $1,200	
Room rental for project planning and education of staff **(indirect)**	- $1,000	
Room rental for intake use and depression screening (**indirect)**	- $4,000	
Social worker time **(indirect)**	- $1,500	
Intake team staff time (4 people) **(indirect)**	- $4,800	
DNP student time **(indirect)**	- $10,000	
Review and analyze DNP project results **(indirect)**	- $800	
	- $22,900	**$1,187.04**

Appendix I

Analysis Tables

Table 1

Frequency Table for Nominal Variables

Variable	*n*	%
Gender		
M	18	100
Missing	0	0
Race/Ethnicity		
American Indian	2	11.11
Asian/ Pacific Islander	2	11.11
Black non-Hispanic	1	5.56
Hispanic	4	22.22
Hispanic/ Pacific Islander	1	5.56
White Non-Hispanic	6	33.33
Missing	2	11.11
Level of Education		
Bachelors	1	5.56
high school diploma	8	44.44
Less than high school	4	22.22
some college	3	16.67
Missing	2	11.11
Insured		
No	4	22.22
Yes	14	77.78
Missing	0	0

Note. Due to rounding errors, percentages may not equal 100%.

Table 2

Summary Statistics Table for Interval and Ratio Variables

Variable	*M*	*SD*	*n*	SE_M	Min	Max	Skewness	Kurtosis
Age	35.50	11.39	18	2.69	21.00	62.00	0.87	0.22

Note. '-' denotes the sample size is too small to calculate statistic.

Table 3

Frequency Table for Nominal and Ordinal Variables

Variable	*n*	*%*
Severity		
Mild	7	38.89
Moderate	4	22.22
Moderately Severe	2	11.11
None - Minimal	5	27.78
Missing	0	0

Note. Due to rounding errors, percentages may not equal 100%.

Table 4

Summary Statistics Table for Interval and Ratio Variables

Variable	*M*	*SD*	*n*	SE_M	Min	Max	Skewness	Kurtosis
Total Score	7.72	4.69	18	1.10	1.00	16.00	0.30	-1.07

Note. '-' denotes the sample size is too small to calculate statistic.

Figure 5

Scatterplots between each variable with the regression line added

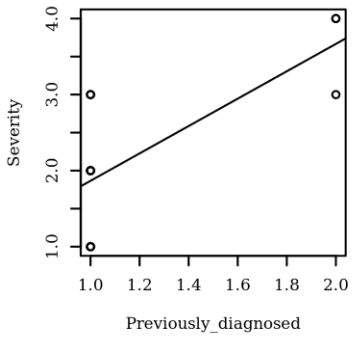


Table 6

Spearman Correlation Results Between Previously diagnosed and Severity

Combination	r_s	Lower	Upper	*p*
Previously diagnosed - Severity	0.63	0.23	0.85	.005

Note. The confidence intervals were computed using $\alpha = 0.05$; $n = 18$

Figure 7

Scatterplots between each variable with the regression line added

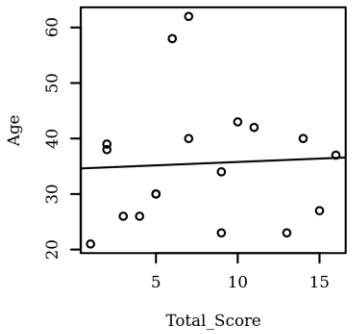


Table 8

Pearson Correlation Results Between Total Score and Age

Combination	r_p	Lower	Upper	*p*
Total Score -Age	0.05	-0.43	0.51	.843

Note. The confidence intervals were computed using $\alpha = 0.05$; $n = 18$