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Evaluating Two Antenatal Depression Screening Tools and Determining the Need for More Routine Administration in Adult Pregnant Women

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DOCTOR OF NURSING PRACTICE

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by

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DEDICATION

To

my dearest husband Ancil, and my beautiful son, Gabriel

thank you for your unconditional love and may I make you both forever proud

for inspiration

“The roots of educaton are bitter but the fruit is sweet”

[Aristotle]

and for perserverance

“I may have been swallowed but I have no intention of being eaten”

[Mac Barnett
The Wolf, The Duck, and The Mouse]

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Doctor of Nursing Practice, Family Nurse Practitioner in Nursing Science

ABSTRACT OF THE DOCTOR OF NURSING PRACTICE PROJECT SCHOLARLY PAPER

Evaluating Two Antenatal Depression Screening Tools and Determining the Need for More Routine Administration in Adult Pregnant Women

by

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Doctor of Nursing Practice, Family Nurse Practitioner in Nursing Science

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Antenatal depression is a non-psychotic depressive disorder that can occur during pregnancy and advance into the postpartum period if not addressed (Verreault et al., 2014). This type of depression can lead to poor maternal and fetal outcomes including and not limited to: gestational hypertension, prematurity, low birth weight, preeclampsia, and mental health problems (Dadi et al., 2020; Sidebottom et al., 2012). Antenatal depression is not routinely screened as evidenced by the clinical guidelines outlined by The American College of Obstetricians-Gynecologists (ACOG) (2018) who recommends screening for depression once perinatally with an emphasis on the postpartum period. In addition, ACOG (2018) offers several different depression screening tools to choose from when screening perinatally including but not limited to: the Edingburgh Depression Scale (EDS) and the Patient Health Questionnaire-9 (PHQ-9). These two depression screening tools are proven to have strong validity and reliability (Bergnik et al., 2011; Brancaglion et al., 2013; Flynn et al., 2011; Heyningen et al., 2018; Kozinsky & Dudas, 2015; Levis et al., 2020; Stewart et al., 2013; Sidebottom et al., 2012; Wang et al., 2021; Woldentensay et al. 2018; Zhong et al., 2014).

Inadequate recognition of antenatal depression could be largely due to the fact pregnant women are not routinely screened throughout pregnancy in accordance with the 2018 national clinical guidelines. The purpose of this quality improvement project is to increase the frequency of screening for antenatal depression, determine if both the EDS and PHQ-9 capture antenatal depression similarly across the three trimesters of pregnancy, and to determine how many pregnant women screen positive with the utilization of these two depression screening tools. Pregnant women who were 18 years or older were screened for antenatal depression in two different trimesters (i.e., first and second or second and third trimester) using both the EDS and PHQ-9 over an 11-week timeframe. Patients who screened positive on one or both depression screening tools were given an immediate in-person interview by the attending OB/GYN; if deemed necessary these patients were referred to a mental health provider. Data was collected via the electronic medical record and input into an excel spreadsheet and percentages were utilized for the data analysis. Findings of this project determined that 1) more pregnant patients screened positive in the second and third trimesters of pregnancy, 2) the EDS captured more positive scores versus the PHQ-9, 3) increased screening for antenatal depression across the three trimesters of pregnancy resulted in more detection of antenatal depression.

CHAPTER 1: INTRODUCTION

Evaluating Two Antenatal Depression Screening Tools and Determining the Need for More Routine Administration in Adult Pregnant Women

Antenatal depression is a non-psychotic depressive disorder that can occur during pregnancy and extend into the postpartum period especially if left untreated (Zhong et al., 2014). Antepartum depression can negatively affect the mother and the fetus which can lead to poor obstetric and neonatal outcomes (Zhong et al., 2014). The Edinburgh Depression Scale (EDS) and Patient Health Questionaire-9 (PHQ-9) are reliable and valid depression screening tools commonly used by women's health providers to screen for antenatal depression. The American College of Obstetricians-Gynecologists (ACOG) (2018) recommends that women health practitioners screen for perinatal depression (with emphasis in the postpartum period) by using either the EDS, PHQ-9, or other depression screening tools such as the Beck Depression Inventory. ACOG (2018) recommends the utilization of the EDS or PHQ-9 over other depression screening tools due to the high number of questions on the other depression screening tools (ACOG, 2018). In addition, ACOG (2018) recommends the EDS over other depression screening tools such as the PHQ-9 because of the increased sensitivity for screening for perinatal depression (ACOG, 2018). Overall, ACOG's (2018) guidelines are highly focused on the postpartum period to conduct depression screening with a decreased emphasis on the antepartum period and encourages healthcare providers to screen for depression once perinatally with a variety of validated and some less sensitive depression screening tools.

This project is a quality improvement project, and its clinical question is to evaluate the concordance between the EDS and the PHQ-9 during pregnancy. Its first purpose is to improve patient outcomes by identifying positive cases of antenatal depression through the administration of the EDS and PHQ-9 during the first and second or second and third trimesters of pregnancy. The second purpose is to assess if it is appropriate or necessary for these screening tools to be routinely administered during the antenatal period.

Background and Significance

According to Zhong et al. (2014), antenatal depression is a "unipolar, non-psychotic depressive episode of mild, moderate, or severe, beginning in or extending into pregnancy" (p. 1). It afflicts 7-20% of women during each trimester of pregnancy and symptoms can reoccur in subsequent pregnancies (Zhong et al., 2014). Depressive disorders during pregnancy are associated with adverse obstetric and neonatal outcomes such as gestational hypertension, preeclampsia, preterm birth, small for gestational age, low birth weight, intrauterine growth restriction, and other complications (Dadi et al., 2020; Sidebottom et al., 2012). Untreated antenatal depression is also linked with an increase in the risk of drug, tobacco, alcohol use, and missed routine prenatal appointments which can be detrimental for both mother and fetus (Sidebottom et. al., 2012; Zhong et. al., 2014). Antenatal depression can even have significant impacts on the child later in life with developmental, emotional, attachment problems, and mental health disorders (Dadi et al., 2020).

In addition to the above risks, Verreault et al. (2014) states that depressive symptoms can be more prevalent or more severe during pregnancy and suggest that approximately 50% of those with depression during pregnancy will continue to be symptomatic in the postpartum period. Approximately 44% of women with high levels of depression in the postpartum period have reported elevated depressive symptoms at early, mid, and late pregnancy (Heron et al., 2004). Pregnant childbearing age females are at the highest risk for developing antenatal depression due to peptide and steroid fluctuations that are normal physiological changes during pregnancy (Dadi et al., 2020). As such, there may be significant impacts from unaddressed antenatal depression for both mother and child for unknown periods of time. With this background knowledge, it is imperative to appropriately screen for antenatal depression in order to identify and treat those afflicted which would help reduce these preventable adverse outcomes of both mother and child.

The PHQ-9 and the EDS are valid, reliable screening tools utilized to identify antenatal depression (Zhong et al., 2014). The EDS and PHQ-9 capture two distinct aspects of antenatal depression in early pregnancy (Zhong et al., 2014). The PHQ-9 captures the somatic symptoms, and the EDS detects depressive symptoms with comorbid anxiety. Zhong et al. (2014) suggest the use of both screening tools

during an evaluation as a means of increasing the sensitivity. In actual clinical practice however, there is inconsistency in the frequency of screenings and in the selection of the type of screening tool to administer. It may be imperative to screen more frequently since depressive symptoms are more severe and prevalent during pregnancy than in the postpartum period (Verreault et al., 2014). By implementing more routine evaluations with the most sensitive and specific screening tool, EDS or PHQ-9, women could be assessed earlier which could subsequently lead to a diagnosis of antenatal depression with prompt intervention (i.e., mental health referral) (Johnson et al., 2021). This could ultimately prevent adverse obstetric and neonatal outcomes and help decrease the risk of postpartum depression (Dadi et al., 2020).

ACOG Guidelines

Current clinical guidelines from ACOG (2018) recommend screening for depression at least once during the perinatal period with focus primarily on the postpartum period while putting less emphasis on the antepartum period. The guidelines state that multiple depression screening tools may be utilized such as the EDS, PHQ-9, Beck Inventory Scale, Center for Epidemiologic Studies Depression Scale, and other depression screening tools. ACOG (2018) also recommends implementing the EDS over other depression screening tools due to the sensitivity towards perinatal depression. In addition, ACOG (2018) also recommends the EDS or PHQ-9 for depression screening because they are shorter questionnaires than the others depression screening tools. The EDS and the PHQ-9 have a smaller number of questions (nine for the PHQ-9 and ten for the EDS), and it is stated within the guideline that it would be easy to complete and score in a timely fashion (ACOG, 2018). This clinical guideline is appropriate for screening for postpartum depression but appears to overlook the antepartum period by only encouraging providers to screen once perinatally.

Problem Statement

The decreased recognition of antenatal depression could be largely due to lack of screening adult pregnant women for depression through and during pregnancy as well as inconsistencies in screening tools used to assess perinatal depression. This is evident as ACOG (2018) suggests obstetrician-

gynecologists and obstetric care providers screen for perinatal depression at least once during the perinatal period with emphasis in screening in the postpartum period by using a standardized screening tool. ACOG (2018) encourages using EDS but also approves of other screening tools, including but not limited to the PHQ-9, Beck Depression Inventory, and Postpartum Depression Screening Scale. To accurately identify antenatal depression in adult pregnant women, additional routine screenings (i.e., more than once perinatally) may be considered during their routine prenatal appointments and by using a more sensitive depression screening tool such as the EDS or PHQ-9. Serial screening for antenatal depression more than once perinatally may help establish a best practice that improves detection and subsequent treatment. This would ultimately improve maternal and fetal outcomes and therefore prevent immediate and long-term risks to mother and child (Dadi et al., 2020).

PICOT Question

In adult pregnant women, what is the concordance between the EDS and the PHQ-9 in detecting antenatal depression during the first and second trimesters and second and third trimesters of pregnancy?

CHAPTER 2: BODY OF EVIDENCE

Review of the Literature

A literature search was conducted and evidence on the effectiveness of the EDS and the PHQ-9 for screening for antenatal depression was obtained. This search was conducted using PubMed and PsychInfo databases as they had the highest yield for pertinent articles for this project.

Pubmed

Keywords and Boolean operators included: ("Pregnancy/psychology"[Mesh] OR pregnan* OR antepartum OR antenatal* OR perinatal) AND depression AND (PHQ-9 OR PHQ9 OR "Patient Health Questionnaire 9") AND Edinburgh Depression Scale. Filters that were applied: English, from 2011-3000/12/12. Total articles obtained from search: 71.

PsychInfo

Keywords and Boolean operators included: (MAINSUBJECT.EXACT("Pregnancy") OR pregnan* OR antepartum OR antenatal* OR perinatal) AND (MAINSUBJECT.EXACT. EXPLODE

("Depression (Emotion)") OR depression) AND (PHQ-9 OR PHQ9 OR "Patient Health Questionnaire 9") AND (Edinburgh Depression Scale). Filters that were applied were Scholarly Journals, English. Additional limits were dates after 2010. Total articles obtained from search: 61.

Inclusion/Exclusion Criteria

The inclusion criteria used for article selection were adult pregnant women, EDS, PHQ-9 questionnaire, antepartum, perinatal, antenatal, and pregnant women who are at least 18 years or older. Exclusion criteria included pregnant women younger than 18 years, non-pregnant adult women, and other forms of depression screening as the primary screening tool.

PRIMSA Chart Explained

One hundred and thirty two articles total were collected from PsychInfo and Pubmed using the above key terms and Boolean operators. In addition, one additional source was included which was the ACOG (2018) clinical guideline. All the articles were input into EndNote software, and 18 duplicated articles were removed leaving a total of 115. These 115 articles were then screened individually by reading the title and abstracts of each article and 100 were further excluded due to participant population being adolescents, inappropriate depression screening tools implemented, and postnatal or labor focused. This left 15 articles that were assessed for eligibility, and it was determined that all 11 articles (two cross-sectional studies, six quantitative studies, and three systematic reviews) and one clinical practice guideline were most pertinent to the project's PICOT.

Appraisal of Evidence

All 15 of the sources, 11 articles and one clinical practice guideline were chosen for this literature review critique and synthesis. The 11 articles were all peer-reviewed and written by either medical researchers, scientists, medical doctors, or were post-doctorate fellows. All 11 articles involved either evaluating the EDS, the PHQ-9, or both of them together in comparison to determine validity, reliability, sensitivity, and/or specificity in detecting antenatal depression. It is important to note that the majority of the literature that was pertinent to this project was within a ten-year timeframe due to the low number of

results populated from the last five years. Also, it is imperative to mention the lack of articles on PHQ-9 and antenatal depression screening (See Appendix C).

Comprehensive Synthesis of Evidence

ACOG's Clinical Practice Guideline and Appraisal

ACOG (2018) recommends that obstetricians and gynecologists (OBGYNs) and other obstetrics providers (i.e., nurse practitioners, nurse midwives) screen for depression at least once during the perinatal period (ACOG, 2018). They recommend screening women in the perinatal period with a validated screening tool and recommend the EDS, PHQ-9, and other depression screening tools such as the Beck Depression Inventory and Center for Epidemiologic Studies Depression Scale (ACOG, 2018). ACOG (2018) also recommends performing a full assessment on mood and well-being during the comprehensive postpartum visit. If healthcare providers screen for depression during pregnancy, then ACOG (2018) also recommends that they screen again during the comprehensive postpartum visit.

The clinical guideline encourages OBGYNs and obstetric providers to screen only once during the perinatal period and focuses more on the postpartum period than during pregnancy itself (ACOG, 2018). With more focus on the postpartum screening, the antepartum period may be overlooked, resulting in potentially missing a large number of pregnant women who are suffering from depression. In addition, the lack of specific timepoints on when to screen (outside of the postpartum period) and variability in screening amongst women's healthcare providers could be detrimental in identifying women who are suffering from depression during pregnancy which could ultimately have adverse effects on both mother and fetus (Zhong et al., 2014). This guideline also does not specifically recommend which screening tool to implement but instead, lists multiple screening tools as options even though some screening tools may not be as sensitive in screening for perinatal depression when compared to others. However, even with these gaps in the clinical guideline, the guideline itself is determined to be of high quality and would be recommended for use in the clinical setting (See Appendix E).

Literature on the Edinburgh Depression Scale

The EDS is a depression screening tool that is commonly used to screen for depression in postpartum women and has been approved for screening for antenatal depression. Even though it was originally designed to screen postnatally, Stewart et al. (2013) found that the EDS can be used to effectively screen for antenatal depression. The EDS is composed of ten questions, available in several different languages, and is known throughout the research as a user-friendly depression screening tool (Bergnik et al., 2011; Brancaglion et al., 2013; Heyningen et. al 2018). This perinatal depression screening tool is also a valid screening tool that can be utilized across different cultures as evident through the satisfactory receiver operating characteristic (ROC) curve analysis results (Kozinszky & Dudas, 2015). Even Stewart et al. (2013) discovered that the translation and modification of the EDS for rural Malwai women produced accurate screening results for depression in pregnancy. The EDS was consistently praised in the literature as a reliable and valid depression screening tool (Bergnik et al., 2011; Brancaglion et al., 2013; Heyningen et al., 2018; Kozinsky & Dudas, 2015).

According to Brancaglion et al. (2013), the EDS had good internal consistency and showed the capacity to discriminate pregnant women with antenatal depression. Brancaglion et al. (2013) found the EDS to have a sensitivity of 90% and a specificity of 70% with a cut-off score of nine compared to Heyningen et al. (2018) who determined that the EDS had an 80% sensitivity and a 76% specificity for both major and minor depression when the threshold score is ≥ 11. Heyningen et. al (2018) went on to conclude that it was the best instrument in detecting major depressive episodes and even has the potential to capture anxiety symptoms. Levis et al. (2020) found that a cut-off score of 11 maximized combined sensitivity (81%) and specificity (88%) compared to the commonly used cut-off score of 13. Levis et al. (2020) also concluded that low cut-off score should be utilized to avoid false negatives and to better capture those who might meet diagnostic criteria. Bergnik et al. (2011) states that the EDS could be easily administered in primary care settings and should be given every trimester of pregnancy to assess depressive symptoms because of its high re-test reliability and great psychometric properties. They also recommend changing the cut-off scores in each trimester by having the cut-off score be 11 at 12-weeks' gestation and a cut-off score of 10 at 24 and 36-weeks' gestation for a better balance in sensitivity

(Bergnik et al., 2011). This said, Kozinsky & Dudas (2015) suggest to lower the cut-off score thus increasing the sensitivity of the EDS in the primary care setting to help prevent missing a depressive disorder and to avoid misclassification. By lowering the cut-off score, it assists the provider in maximizing detection and allows for the potential referral to psychiatry to occur more readily (Kozinszky & Dudas, 2015). The above studies concluded that the EDS was a valid screening tool for antepartum depression, and the implementation of it can have significant positive impacts through increased recognition, as well as in the diagnosis and treatment, of antenatal depression (Bergnik et al., 2011; Brancaglion et al., 2013; Heyningen et al., 2018; Kozinsky & Dudas, 2015; Levis et al., 2020; Stewart et al., 2013).

Literature on the Patient Health Questionnaire-9

The PHQ-9 is a standard general clinical depression screening tool that is composed of nine questions, is generally well-understood, and culturally acceptable for patients (Woldentensay et al., 2018). Wolentensay et al. (2018) state that the PHQ-9 has acceptable validity and reliability in screening for antenatal depression symptoms and for measuring the severity of symptoms in adult pregnant women. They found the sensitivity of the PHQ-9 in screening for antenatal depression to be 80.8% and specificity of 79.5% with a cut-off score of eight (Woldentensay et al., 2018). However, they discovered that the interpretation of opposite symptoms in questions three, five, eight of the PHQ-9 to be challenging for patients, and this was a consistent finding in previous studies. With this challenge noted, there are evident difficulties in a patient's understanding these questions which could affect the psychometric properties of the PHQ-9. Wolentensay et al. (2018) suggest asking the questions forward and then backward and then scoring the more severe response as the symptom.

In the article by Sidebottom et al. (2012), they state the specificity and sensitivity rates for the PHQ-9 questionnaire were greater than originally hypothesized compared to other studies. They found that the sensitivity of the PHQ-9 was 85% and the specificity was 84% with a cut-off score of ≥ 10 (Sidebottom et al., 2012). They also concluded that the PHQ-9 had a high positive predictive value which means that it identified many women with pervasive distress who could benefit from an appropriate

intervention (Sidebottom et al., 2012). Sidebottom et al. (2012) did notice one possible difficulty with the PHQ-9 in assessing for depression in pregnant women. They found that assessing for depression prenatally could be challenging because many depression symptoms were common in pregnancy such as fatigue, appetite changes, and sleep problems (Sidebottom et al., 2012).

Wang et al. (2021) discovered that the PHQ-9 has good diagnostic characteristics as a screening tool for the evaluation of antenatal/perinatal depression. It has high sensitivity (84%), specificity (81%), and an area under curve (AUC) that was >0.80 with a cut-off score of 10. This finding is similar to the performance of other validated depression scales (Wang et al., 2021). Overall, both Wang et al. (2021), Woldentensay et al. (2018), and Sidebottom et al. (2012) conclude that the PHQ-9 is an appropriate depression screening tool to use to screen for antenatal depression because of high rates of sensitivity, specificity, AUC, and positive predictive value.

Literature Comparing the EDS and PHQ-9

Side by side comparison of the EDS and the PHQ-9 questionnaire revealed few major differences in the performance between the two screening tools. In Flynn et al. (2011), the study findings discovered that both screening tools "performed adequately at the commonly used and recommended cut-off points, with no significant differences between pregnant women and postpartum women" (Flynn et. al., 2011, para. 15). Statistically, both screening tools were adequate and similar in internal consistency reliability with cut-off scores of ≥ 13 for the EDS and ≥ 10 for PHQ-9 (Flynn et al., 2011). When comparing the two screening tools with the AUC and ROC, it was found that contrasts were not significantly different in accuracy (0.89 (95% CI =0.78-1.00) and 0.86 (95% = 0.75-0.98) for EDS and PHQ-9). However, the EDS resulted in a higher number of correctly identified pregnant women with antenatal depression compared to the PHQ-9 (Flynn et al., 2011). Flynn et al. (2011) concluded an interesting point in their discussion that the PHQ-9 questionnaire might be more appealing because it is a common screening tool used in various medical specialties and one could easily compare scores from previous evaluations.

As stated in the PHQ-9 literature section, Wang et al. (2021) demonstrated that the PHQ-9 was sensitive and specific in assessing perinatal depression. When Wang et al. (2021) compared the PHQ-9

with the EDS, they found that the two depression screening tools have comparable median sensitivity, specificity, and AUC. Thus, either scale may be reasonable for perinatal depression screening. Wang et al. (2021) states that the EDS has more validation studies and stresses the importance to further validate the PHQ-9 with larger sample studies and with more comparisons with the EDS.

Similar findings were true in Zhong et al. (2014) but this study exposed a crucial difference between the two screening tools. Zhong et al. (2014) found that both the EDS and the PHQ-9 demonstrated good internal consistency, construct, and concurrent validity in screening for antenatal depression during early pregnancy with a cut-off score ≥ 10 (Zhong et. al., 2014). It also explained that both screening tools capture different aspects of depression in antenatal depression. The EDS captures depressive symptoms that are co-occurring with anxiety and the PHQ-9 assesses common somatic symptoms during pregnancy. Zhong et al. (2014) concludes that it could be beneficial to combine both screening tools to help improve the identification of women who may be at risk for antepartum depression.

Identification of Various Themes through the Literature Review

The articles from the literature review consistently concluded high internal consistency, reliability, and validity of the PHQ-9 and the EDS. This means that both depression screening tools are appropriate and effective in screening for antenatal depression in adult pregnant women. In addition, some themes and subthemes were discovered about the two depression screening tools. The first theme was that EDS can be used as a valid and reliable screening tool for antenatal depression and the second theme was that the PHQ-9 can be used as a valid and reliable screening tool for antenatal depression. The first subtheme discovered was that the EDS was an "easy to use" screening instrument that could be implemented across multiple cultures. Most of the research regarding the EDS had been conducted on Caucasian adult pregnant women however, there are also articles that focused on Brazilian and African (Malawi) adult pregnant women. The conclusion of these articles was that the EDS was easily translated and understood by all groups indicating that it can be used amongst many different cultures/languages. This confirms that the EDS is a reliable and valid screening tool in screening for antenatal depression and

could easily be generalized to other cultures/languages/groups due to its availability in over thirty different languages (Bergnik et al., 2011). Therefore, the EDS can be used to effectively screen adult pregnant women across many cultures.

In addition, the EDS and the PHQ-9 were administered mainly in the first and third trimesters. It is an observation that researchers may have selected the first trimester to detect depression early in pregnancy and the third trimester was selected as the researchers were investigating the possible connection between depression near the end of pregnancy and the overlap it could have with postpartum depression (Bergnik et al., 2011; Brancaglion et al., 2013; Flynn et al., 2011; Heyningen et al., 2018; Kozinsky & Dudas, 2015; Woldentensay et al. 2018; Zhong et al., 2014). Furthermore, the cutoff scores for the EDS were inconsistent throughout the literature review compared to the PHQ-9 which appeared to be more consistent. The cut-off scores for the EDS ranged from nine, ≥ 10, ≥ 11, and ≥13 whereas the cut-off scores for the PHQ-9 were typically ≥ 10. This varied range of cut-off scores could be due to how each research study determined the sensitivity and specificity with the EDS. For example, as mentioned above by Kozinsky & Dudas (2015), lower cut-off scores could increase the sensitivity of the EDS. With these variances noted, Flynn et al. (2011) encourages individuals to use commonly recommended cut-off scores for both depression screening tools.

Summary of Evidence

In summary, the findings from the literature review concluded that both depression screening tools express high rates of sensitivity, specificity, and positive predictive value which leads to the conclusion that both depression screening tools are effective and appropriate for screening for antenatal depression (Bergnik et al., 2011; Brancaglion et al., 2013; Flynn et al., 2011; Heyningen et al., 2018; Kozinsky & Dudas, 2015; Levis et al., 2020; Stewart et al., 2013; Sidebottom et al., 2012; Wang et al., 2021; Woldentensay et al. 2018; Zhong et al., 2014). However, it has been suggested that the EDS may benefit from a lower cut-off score to increase sensitivity in evaluating antenatal depression and thereby, decrease the chances of misclassification (Kozinszky & Dudas, 2015). Both depression screening tools

meet the standard of care according to ACOG (2018) guidelines as they list the EDS, PHQ-9, and other different types of depression screening tools that are appropriate to use in the clinical setting.

The literature review and clinical guideline supported the fact that there is not a predetermined specific period of time when to screen and how frequently to screen for antenatal depression. ACOG (2018) recommends to screen only once perinatally with specific emphasis during the postpartum period. Even though it was deemed to be an appropriate clinical guideline according to the AGREE II appraisal, it unfortunately overlooks the antepartum population by focusing primarily on screening in the postpartum period and provides little encouragement to screen antenatally. When some of the articles were evaluated during the literature review critique, it was observed that many of the researchers chose different trimesters in which to screen for antenatal depression (Bergnik et al., 2011; Brancaglion et al., 2013; Flynn et al., 2011; Heyningen et al., 2018; Kozinsky & Dudas, 2015; Woldentensay et al. 2018; Zhong et al., 2014). This adds to the discrepancies on the timing and frequency to screen for antenatal depression.

Evidence-Based Recommendation

Based off of the literature review and ACOG (2018) clinical guideline findings, it was recommended that depression screening be performed in the antenatal period using both the EDS and the PHQ-9 at least twice during a singular pregnancy in at least two different trimesters. This recommendation was supported by multiple reasons and sources (Dadi et al., 2020; Bergnik et al., 2011; Zhong et al., 2014). First, hormone and peptide fluctuations are known to occur during pregnancy and are known to contribute and/or exacerbate antenatal depression (Dadi et al., 2020). In addition, it is known that antenatal depression symptoms tend to persist or could also re-occur in subsequent pregnancies (Dadi et al., 2020). Undetected antenatal depression during the third trimester has the potential to carry over into the postpartum period placing the mother at risk for postpartum depression (Dadi et al., 2020 & Verreault et al., 2014). This recommendation would also closely follow the conclusions given by Bergnik et al. 2011). Bergnik et al. (2011) conclude that depression screening during pregnancy is imperative and should be done in every trimester to allow for a more comprehensive evaluation of the presence of antenatal depression.

Secondly, Zhong et al. (2014), recommends using both EDS and PHQ-9 depression screening tools together to detect antenatal depression because each tool captures a different aspect of antenatal depression (i.e., somatic and anxiety symptoms). By implementing both depression screening tools antenatally, one is able to comprehensively screen for different types of symptoms that afflict pregnancy. In addition to capturing different symptoms, the EDS and PHQ-9 are known to have high sensitivity and specificity in evaluating for antenatal depression and are validated through the literature (Bergnik et al., 2011; Brancaglion et al., 2013; Flynn et al., 2011; Heyningen et al., 2018; Kozinsky & Dudas, 2015; Levis et al., 2020; Stewart et al., 2013; Sidebottom et al., 2012; Wang et al., 2021; Woldentensay et al. 2018; Zhong et al., 2014).

Thirdly, ACOG (2018) guidelines encourage healthcare providers to screen for perinatal depression at least once during the entire perinatal period. In addition, ACOG (2018) places emphasis on screening in the postpartum period and does not place an emphasis on depression screening antenatally. This clinical guideline overlooks the antepartum period in which a pregnant woman may be afflicted with depression but remains potentially undiagnosed. This gap in care could lead to poor maternal and fetal outcomes due to lack of routine antenatal depression screening. The lack of depression screening antenatally and undetected antenatal depression could potentially be the cause for the significant prevalence of postpartum depression (Dadi et al., 2020).

Therefore, it was imperative to conduct this project to examine the concordance between the EDS and PHQ-9 to determine which one has a better screening outcome and/or if they perform better together for a more comprehensive screening of antenatal depression. It was also imperative to know if standard screening in the antenatal period can diagnose more cases of antenatal depression that may have otherwise been missed, and if more frequent screening during this period helps in providing a more thorough evaluation of the presence of antenatal depression. The results from this project could improve patient outcomes and promote the early detection of antenatal depression.

CHAPTER 3: PROJECT FRAMEWORK

Conceptual Framework

Donabedian model was the type of conceptual framework that was utilized to help guide the project. This model focuses on three main categories: structure, process, and outcome (Moran et al., 2019). The structure component of this framework was seen in the setting of the project and those that were involved (Moran et al., 2019). The process component of this conceptual framework involves what was done and how it was delivered (Moran et al., 2019). Finally, the last component involves the outcome which entails how the project was reviewed, measured, and assessed (Moran et al., 2019). The Donabedian model will be described below and details of this process will be incorporated with the integration of the logic model.

Logic Model

This project utilized an Outcomes Approach Logic Model (Kellogg Foundation, 2004). The Outcome Approach Logic Model outlines the link between planned activities and the expected outcomes (Kellogg Foundation, 2004). For this project, activities were seen as educating clinical staff and administering the EDS and PHQ-9 in two different trimesters. The outcome was demonstrated through more comprehensive antenatal depression screening. The Outcomes Approach Logic Model encourages the focus to be on the difference that would be achieved and not just the process and inputs provided by a service. This project focused on the positive impact (i.e., early detection, referral to mental health specialist, and improve/preserved maternal/fetal outcomes) of increased antenatal depression screening on adult pregnant patients. This logic model emphasized focusing on the activity (i.e., increasing screening frequency) and achieving tangible benefits for people (i.e., appropriate care for positive screen and positive maternal/neonatal outcomes). The combination of the Donabedian Model and Outcomes Approach Logic Model are outlined in detail in Figure 1.

CHAPTER 4: METHODS

Project Purpose

The first purpose of this scholarly project was to examine and identify the number of women who screen positive for antenatal depression with utilization of the EDS and the PHQ-9. The second purpose was to compare the proportions between both PHQ-9 and EDS and determine if they are equal

proportionally across timepoints throughout the course of an adult woman's pregnancy. The third purpose of this project was to increase the frequency of screening for antenatal depression across at least two trimesters. The project aim was to improve overall antenatal depression identification with a goal of prompt evaluation and more routine of depression screening.

Project Outcomes/Goals

Immediate/Short-Term Outcomes

The first short-term outcome was that all the participants complete both the EDS and the PHQ-9 at either the first and second trimester or second and third trimester. By achieving this outcome, it would help limit the number of participants who would have to be excluded and could help increase the total sample size depending on the volume of pregnant participants at the time of implementation. The second short-term outcome was that the documentation of screening is complete in the medical record. Finally, the last short-term outcome was that documentation of a referral to a mental health provider be performed if the participant were to screen positive on either of the two depression screening tools. The last two outcomes were mperative to allow for an appropriate analysis of the project.

Intermediate Outcomes

The first intermediate outcome was to determine if the increased frequency of screening (i.e., once in two trimesters of pregnancy) was a more comprehensive evaluation of antenatal depression than the recommended clinical guideline given by ACOG. The second intermediate outcome was to determine the screening results from the PHQ-9 and EDS on antenatal patients. Finally, the third intermediate outcome was to evaluate the increase in referrals to a mental health specialist to evaluate if participants who screened positive received the support that they need to help with symptoms of antenatal depression.

Long-term Outcomes/Impact

The first long-term outcome was to have consistent utilization of the more sensitive screening tool (i.e., either PHQ-9 or EDS) in at least two points during pregnancy or throughout pregnancy. The second and third long-term outcomes was to ensure that antenatal depression is diagnosed earlier during pregnancy and that interventions such as a referral to a mental health specialist is initiated earlier.

Project Description

Project Type/Design

Evaluating Two Antenatal Depression Screening Tools and Determining the Need for Increased Frequency of Administration in Adult Pregnant Women project was a quality improvement project because it is aimed at improving antenatal depression screening and detection. This was demonstrated by increasing the frequency of screening (i.e., EDS or PHQ-9) to assess if it captures antenatal depression more comprehensively. The design of this project was conducted as a retrospective chart review through de-identified data collection obtained from the clinical site's electronic medical record. Data was only collected in this manner and there was no patient contact or observation done to preserve patient privacy and integrity.

Project Timeline

Implementation of this project and data collection began on January 2022 through March 2022 at a private OB/GYN clinic in Southern California. From April 2022 until May 2022 the data collected was analyzed, interpreted, and results were written for the final project presentation. From May 2022 until June 2022 the results of the project were formally shared with the clinical site in which this project was conducted and academically presented to the project chairs, members of the inaugural cohort, and family.

Project Setting and Population

This project was conducted at a private practice women's health clinic in Southern California. This clinical site provided care to pregnant women and other women of varying ages from adolescents to older adults. This private practice was well staffed with several OB/GYNs, nurse practitioners, physician assistants, MAs, ultrasound technologists, and office staff. Each OB/GYN had their own MA and they shared NPs, PAs, ultrasound technologists, and office staff. There was frequent contact with members of the project team who included one OB/GYN, one MA, and various office staff to facilitate the implementation and success of this project. Contact with the project team consisted of an in-person education prior to implementation, mid-implementation project evaluations, and post-implementation interaction to present the projects results.

Participant Recruitment

Participants were identified by the front office staff and MA as meeting criteria of 18 years or older, female, pregnant, and in their first or second trimester of pregnancy. If the participants did not meet the above criteria then they were excluded from participating in this project.

Description of Intervention

Prior to the implementation of the project, education was provided to the project team. A 20-30-minute educational session occurred with the project leader, OB/GYN, MA, and an office staff member to discuss individual roles and responsibilities (See Appendix J for MA pre-implementation survey). The implementation of the project began when the adult pregnant patient was given the EDS and PHQ-9 after arrival and check in to the OB/GYN clinical practice site in Southern California. The MA provided the EDS and PHQ-9 screening form to the patient once they were in a private exam room. The patient completed the two screening tools in the private exam room while they waited to be seen by the OB/GYN. The MA retrieved the completed questionnaires and gave them to the OB/GYN to score and analyze. The process described above occurred at least twice during pregnancy and this process was conducted in this manner: if the patient is in the first trimester of pregnancy they would be screened in that trimester and then again in the second trimester. If the patient is in the second trimester of pregnancy, they would be screened in that trimester and then again in the third trimester.

If a positive assessment was identified by the OB/GYN with either of the depression screening tools, then an in-person interview occurred with a potential referral to mental health or maternal mental health specialist. If the participant screened positive for the suicidal ideation question (#9) on the PHQ-9 and/or the harming oneself question (#10) on the EDS then there would have been a prompt in-person evaluation and a potential referral to the emergency department or to a mental health specialist.

The EDS and PHQ-9 was first administered and completed during the first trimester, approximately 0-13 weeks' gestation and in the second trimester, approximately 14-27 weeks' gestation. Then the EDS and PHQ-9 was re-administered in either the second trimester or third trimester, approximately 28-40 weeks' gestation. After the two depression screening tools were completed and

retrieved, there was an analysis of the concordance of the EDS and PHQ-9 by examining the cut-off scores (i.e., cut-off scores that are ≥10 for EDS or ≥10 for PHQ-9).

Instruments

EDS

The EDS is a valid, reliable, and commonly used 10-item depression screening tool used to screen for depression during the antenatal and postpartum period. The EDS questionnaire asks questions (i.e., items) on how the patient has been feeling over the past seven days. The EDS questions include (1) the ability to laugh (2) anhedonia (3) guilt (4) anxiety (5) panic attacks (6) overwhelmed (7) sleep disorders (8) sadness (9) tearfulness and (10) suicidal idea (Zhong et al., 2014). The EDS does not emphasize the somatic symptoms such as changes in sleep and appetite, along with loss of energy (Zhong et al., 2014). Response categories are scored 0,1, 2, and 3 for each item according to increased severity of the listed symptom (Zhong et al., 2014). Items three and 5-10 are scored reverse which means the "top box" is a score of 3 and the "bottom box" is a score of 0. The individual questions are then totaled to give a score that ranges from 0 to 30. The cut-off score will be ≥10 and will indicate a positive score which could indicate a possible depressive disorder. For this project, a score of ≤ 10 would indicate no possibility of depressive disorder and a score of ≥ 10 would indicate a possible depressive disorder. These cut-off scores were chosen based on the high sensitivity and specificity as seen in the literature and are typically what is used in clinical practice (Bergnik et al., 2011; Zhong et al., 2014).

PHQ-9

The PHQ-9 is a valid and reliable nine-item depression screening tool most commonly used across various medical specialties. This depression screening tool screens the frequency of depressive symptoms over the past two weeks. The PHQ-9 assesses the following nine depressive symptoms: (1) anhedonia (2) depressed mood (3) insomnia or hypersomnia (4) fatigue or loss of energy (5) appetite disturbances (6) guilt or worthlessness (7) diminished ability to think or concentrate (8) psychomotor agitation or retardation (9) suicidal thoughts (Zhong et al., 2014). The PHQ-9 score is calculated by assigning a score of 0, 1, 2, and 3 to the response categories of "not at all", "several days", "more than

half the days", and "nearly every day" (Zhong et al., 2014). The items are scored and calculated with a range from 0-27. The cut-off scores used for this project will be ≤10 and ≥10 for this project. The cut-off score of ≤10 would indicate no possibility of major depressive disorder and would be considered a negative score. The cut-off score for a positive screen was ≥ 10 indicating the possibility of a major depressive disorder. This cut-off score was chosen because of high sensitivity and specificity rates as demonstrated in the literature (Sidebottom et al., 2012; Zhong et al., 2014).

Data Collection Procedures

Data was collected at the private OB/GYN clinical practice site from January 2022 through March 2022. The patients' medical record number (MRN), depression screening scores from EDS and PHQ-9, lifestyle characteristics, medical and reproductive histories, and personal history of mental health disorders were obtained from the electronic medical record. This data described above was documented into an electronic Excel spreadsheet for collection.

The data collection was coded in the excel spreadsheet and was characterized as described below. Trimester stage ("first", "second", and "third"), parity ("nulliparous", "parous"), gravidity ("primigravida", "multigravida"), history of mental illness ("yes", "no") and type of mental illness ("none", "depression", "anxiety", "both depression/anxiety", "bipolar").

Data Analysis

This project utilized percentages to conduct the data analysis. This mathematical approach was performed manually by the project lead by using an Excel Spreadsheet document containing the data collected during the implementation of this project. This method was preferred to discover 1) the percentage of patients who screen positive with the EDS or PHQ-9 for antenatal depression during the three trimesters of pregnancy, 2) to discover the percentage patients who screened positive that were referred to a mental health specialist, 3) to discover the percentage of patients who screened positive's pertinent medical history (i.e., mental health history and OB/GYN history).

The project lead initially wanted to and did answer the following: determine the frequency of screening to better evaluate for antenatal depression, determine if each depression screening tool, EDS

and PHQ-9, evaluates antenatal depression consistently throughout the different timepoints pregnancy (i.e., first, second, and third trimesters), and identify the number of pregnant women who screened positive for antenatal depression with the utilization of the EDS and PHQ-9.

Stakeholders/Barriers

The stakeholders of this project included one OB/GYN, one MA, and other clinical staff such as the office/front desk staff at the private practice women's health clinic in Southern California. The OB/GYN facilitated this project by analyzing the EDS and PHQ-9 and determining whether the patient needed further evaluation/treatment by a mental health specialist (i.e., maternal mental health clinic, emergency room, or psychiatry). The MA helped facilitate this project by screening for eligibility by viewing the clinical schedule and by administering the two screening tools in one trimester and then again in the consecutive trimester. They were also responsible for ensuring the two depression screening tools were completed appropriately and that the patient was screened for the second time in the consecutive trimester (i.e., first and then second trimester or second and then third trimester). The office staff helped facilitate this project by informing the MA when the patient is scheduled for their consecutive trimester visit. Barriers to the project that could have occurred is that the MA does not perform the second depression screening or that the depression screening tools are not completed correctly. Another barrier could be that the office staff does not inform the MA about the consecutive trimester appointment and that subsequent screening is missed. In addition, the OB/GYN may have forgetten to score and analyze the EDS and PHQ-9 which could complicate the project results. To avoid this, there was a project team education prior to the implementation on the roles and responsibilities of each member. Also, there was continuous project evaluations during the implementation of this project to assure that these barriers did not occur.

Ethical Considerations

The project lead on this DNP project completed human subjects training, received permission from the private practice clinic, and obtained Institutional Review Board (IRB) oversight from the

University of California, Irvine. This project analyzed data from previously administered screening tools and thus fulfilled non- human subjects' protection and therefore, did not require IRB approval.

Formative Process Evaluation

The formative evaluation for this project used a succinct five-question survey to evaluate the project's implementation. The MA completed questions 1-4 as they screened the patients for antenatal depression as well as determined when the patients are to return for their second consecutive screening. Question 5 was answered by the attending OB/GYN to ensure that those who screened positive were being evaluated further and offered a medical intervention if deemed necessary (i.e., mental health referral).

The EDS and PHQ-9 were administered at the first and second screening intervals without any errors during the early phases of project implementation. As for eligibility , the MA screened adult pregnant patients who are 18 years or older without any difficulty. In fact, most of the pregnant patients who are cared for at this clinic are primarily in their 20's, 30's, or 40's. Therefore, accidentally screening a patient who is ineligible for this project was not an issue.

Ongoing communication with the front office staff and the MA was never established because the MA had full access to the clinic schedule. This was discovered earlier on in the implementation process and was eliminated as it would have been an unnecessary step since the MA had full access to the clinical schedule. During this point of time, there was no missed initial or second interval antenatal depression screenings. The attending OB/GYN assessed all patients who screened positive on one or both antenatal depression screening tools and referred those who required more support to a mental health specialist. Overall, the implementation of this project was well executed without errors. Adjustments involving the front desk staff were made within the first week of implementation.

CHAPTER 5: RESULTS AND CONCLUSIONS

Results

The number of patients screened successfully utilizing both the EDS and PHQ-9 at their appropriate intervals was a total of 23. The number of pregnant patients screened in the first and second

trimester group was a total of 8; the number of pregnant patients screened in the second and third trimester group was a total of 15. There was a total of five patients that were not screened during the second consecutive screening interval; all five of those patients happened to be in the second and third trimester group.

It was found in the first and second trimester group that 0% (n = 0) of the eight patients screened positive during the first trimester screening with both screening tools; 0% (n = 0) of the eight patients screened positive in the second trimester of this group with both depression screening tools. For the 15 patients screened in the second and third trimester group, 13% (n = 2) screened positive with the PHQ-9 in the second trimester and 13% (n = 2) screened positive with the PHQ-9 in the third trimester. As for the EDS in the second and third trimester group, the second trimester yielded 33% (n =5) screened positive and in the third trimester, 26% (n = 4) of patients screened positive. A total of 13% (n =2) of patients screened positive during both screening intervals.

It was determined that 26% (n = 6) patients screened positive for antenatal depression with one or both the depression screening tools and 66.6 % (n = 4) were primigravids/nulliparous and 33.3 % (n = 2) were multigravidas/multiparous. Of those who screened positive, 33% (n = 2) had a previous mental health diagnosis of either anxiety or depression with anxiety; 50% (n = 3) of the pregnant patients were referred to maternal mental health after a positive screen and in-patient interview by the OB/GYN; no patients were admitted to the ED during this project (See Figures 2-5).

Summative Evaluation

This DNP project utilized a post-implementation survey composed of eight questions and was administered and completed by the MA. It was determined that the PHQ-9 and EDS were appropriately administered during the first and second trimesters of pregnancy for the initial (i.e., first) screening interval. There were no errors in this portion of project implementation and no third trimester patients were screened at the initial screening interval for antenatal depression for this project. In addition, patients were appropriately screened during the second and third trimesters at the second consecutive screening

interval. The patients who screened positive with either the EDS or PHQ-9 were interviewed by the OB/GYN during that clinical visit and there was never a missed in-person interview by the OB/GYN.

It was discovered early in the implementation of this project that there was not a need for establishing communication with the front desk about when the patient would be returning for their prenatal appointment during their second consecutive screening interval. The MA found it much easier to just screen the clinical schedule daily versus involving another party to determine when the patient would be returning for the second consecutive screening. Daily clinical schedule screening was then adopted for the remainder of the project by the MA. The MA stated that she was still able to fulfill her roles and responsibilities of this project to the best of her ability. She informed the project lead that in a future implementation of this project it would be wise to have more time to complete versus 11-weeks.

Overall, this project was very successful given the 11-week timeline. The patients who were screened for the project met eligibility, were appropriately screened during their screening intervals, and for those that had a positive screen were given an in-person interview. Some even received prompt medical intervention as a result of their screening evaluations. In addition, the project team members were instrumental in the success of this project and performed their roles to the best of their abilities. There are improvements that can be adopted to assist in a more seamless project implementation such as eliminating the front desk office involvement and others that will be addressed with the limitations of this project.

Discussion

Implications

This project demonstrated an increased detection of antenatal depression especially of those in the second and third trimesters. In fact, this project found that 26% (n = 6) of the patients were suffering from antenatal depression and of that 26%, 50% (n= 3) were referred to a mental health provider. These numbers correlate with the literature as Zhong et al. (2014) found that 7-20% of pregnant women suffer from antenatal depression. In addition, this project demonstrated that the EDS was more effective in screening antenatal depression (33% in the second trimester and 26% in the third trimester) compared to the PHQ-9. However, the PHQ-9 was marginally effective in screening for antenatal depression as it

captured 13% of patients in the second and third trimester group. These findings correlate with Flynn et al. (2011) who stated that the EDS resulted in a higher number of correctly identified pregnant women with antenatal depression compared to the PHQ-9. These findings could help encourage this practice as well as other health care providers to more frequently screen (i.e., especially in the second and third trimester) for antenatal depression during pregnancy and it could be a useful contribution to literature regarding antenatal depression screening. This increased screening in clinical practice could help detect antenatal depression earlier which would allow more prompt interventions, as demonstrated through this DNP project, which would preserve/improve maternal and fetal outcomes.

Limitations

There were a couple limitations of this project the first being that patients were seen by other providers during their second consecutive screening interval. It was found to be difficult to administer the second interval antenatal depression screening because some patients were being seen by other providers within the office and it was challenging for the MA to remember when a particular patient was coming in for their second consecutive screening as they were on a different provider schedule. This could be the cause of why five patients were not screened during their second interval screen. A second limitation was that the 11-week time frame was deemed restrictive for this project. This restriction could have also caused the five patients to miss their second consecutive screening as it was possible that they were screened very early in the second trimester.

Sustainability

The long-term sustainability of this project will depend on the willingness of the practice to continue its implementation. The project revealed the better detection of antenatal depression throughout pregnancy with more routine screening with the depression screening tools but especially with the EDS. It is possible this could impact the clinical site practice and could create changes in their own clinical practice. However, at this time it is unknown whether this practice will adopt increased screening for antenatal depression throughout pregnancy.

Dissemination Plan

The dissemination plan included a formal presentation to the clinical staff and OB/GYN at the private practice in which the project was conducted in May 2022. Dissemination of the findings was performed with a final presentation of the project with its results to the chairs of the project, members of the inaugural cohort, and family in May 2022.

Conclusion

This DNP project was created and conducted to increase antenatal depression screening through the course of pregnancy. ACOG (2018) clinical guidelines recommend only screening once during the perinatal period and focusing most of their attention on postpartum depression compared to antenatal depression. In addition, ACOG (2018) recommends utilizing various different types of depression screening tools including and not limited to the EDS and PHQ-9. The literature demonstrated that both the PHQ-9 and EDS were valid, reliable, and effective in screening for antenatal depression throughout pregnancy. The purposes of this project were to examine and identify the number of women who screen positive for antenatal depression with the utilization of the EDS and the PHQ-9, compare the proportions between both PHQ-9 and EDS and determine if they are equal proportionally across timepoints throughout the course of an adult woman's pregnancy, and increase the frequency of screening for antenatal depression across at least two trimesters. The overall purpose was to improve antenatal depression identification with a goal of prompt evaluation and more routine depression screening.

The results of this project revealed that six (26%) patients screened positive for antenatal depression and three (50%) were referred to a mental health provider for further evaluation. The EDS identified antenatal depression more frequently in the second and third trimester compared to the PHQ-9. The findings of this project correlated with the most recent literature. In addition, this project increased antenatal depression screening through all three trimesters of pregnancy.

To further improve this project in the future, it is recommended to have all the patients be seen by one provider to be able to be consistent with screening and prevent missed screening intervals. In addition, it is recommended that the timeframe to screen for antenatal depression be longer than 11 weeks as this was restrictive and could have contributed to the missed screenings especially in the third

trimester. Finally, it is recommended that front desk staff involvement be eliminated from the implementation process. However, with this said, this project has been successful in its implementation and has been fortunate enough to impact many lives through early screening of antenatal depression and prompt medical intervention.

DNP Essentials

Completing this DNP project has allowed the project lead to meet the DNP Essentials and become a DNP prepared Scholar. This has been accomplished by 1) using science-based theories to enhance and improve antenatal depression screening, 2) developing a delivery of care (i.e., increasing antenatal depression screening) to meet the needs of certain patient populations (i.e., pregnant women), 3) critically appraise literature and other evidence and apply relevant findings to improve clinical practice, 4) ability to safely extract practice information from systems/databases, and 5) employ effective communication and collaborative skills in the development and implementation of practice models (American Association of Colleges of Nursing, 2006).

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Appendix A

Letter of Cooperation

Letter of Cooperation with Outside Organization for UCI DNP Project

Date: 10/06/2021

Dear: (name of DNP Student): Drew Philip

This letter confirms that I, as an authorized representative of
allow the above-named Doctor of Nursing Practice student access to conduct a leadership, policy, quality improvement, or evidence-based practice project activities at the listed site(s) as discussed with the DNP student and outlined below. These activities may commence after the DNP student has consulted with UCI IRB about the proposed project.

- **Project site(s):** (list specific site name and address for all sites within which the organization is providing student access to conduct the project)

  Pacific Women's Healthcare Associates
  500 Superior Ave #310
  Newport Beach, CA 92663

- **Project purpose:** (briefly summarize the project purpose, plan and expected outcomes)

  To determine the concordance between the PHQ-9 and the EDS during pregnancy and to determine if there is an need to increase depression screening in pregnant women ages 18 and older.

  See below.

- **Project activities:** (briefly summarize the activities that will commence at the site, including any baseline data collected, educational interventions, PDSA cycle proposed...)

  MA to give patient the two depression screening tools at routine prenatal appointments during first, second, and third trimester (i.e., 1st and 2nd trimester or 2nd and 3rd trimester, or 1st, 2nd, 3rd trimester). Any positive screens will be involve prompt notification of the MD, MD will discuss positive screen results with patient and have patent interview, and potentially refer to maternal mental health.

- **Target population:** (identify the population upon whom the project will focus)

  Pregnant women 18 years and older

- **Site(s) support:** (briefly describe the support the project site(s) agree to provide to support the project, such as space to conduct project activities, data retrieval from electronic records, facilitation of educational activities....)

  Clinic space (i.e. private patient rooms and waiting rooms) to conduct project activities and data collection from EMR and patient depression screening questionnaires.

- **Data management plan:** (briefly describe the plan for management of data such as what data will be collected, whether it will be identified/de-identified, what protections will be in place for data protection...)

  De-identified data will be collected via the EMR (nexgenmd) and from the two depression screening tools.

- **Other agreements:** (briefly describe any additional agreements that have been made to support the project, if applicable)

  N/A

- **Anticipated end date:** (indicate the anticipated date that the project will be concluded at the site)

  Start date: December 2021
  End date: March/April 2022

It is understood that all DNP Scholarly Project related activities must cease if directed by UCI IRB. It is also understood that any activities that involve Personal Private Information or Protected Health Information must comply with HIPAA Laws and institutional policy.

Our organization agrees to the terms and conditions stated above. If there are any concerns related to this project, we will contact the DNP student named above and their DNP Scholarly Project Chair. For concerns regarding IRB policy or human subject welfare, we may also contact our own institutional IRB.

UCI IRB: https://www.research.uci.edu/compliance/human-research-protections/researchers/irb-faqs.html

With regards,

(Signature of Project site-authorized representative)

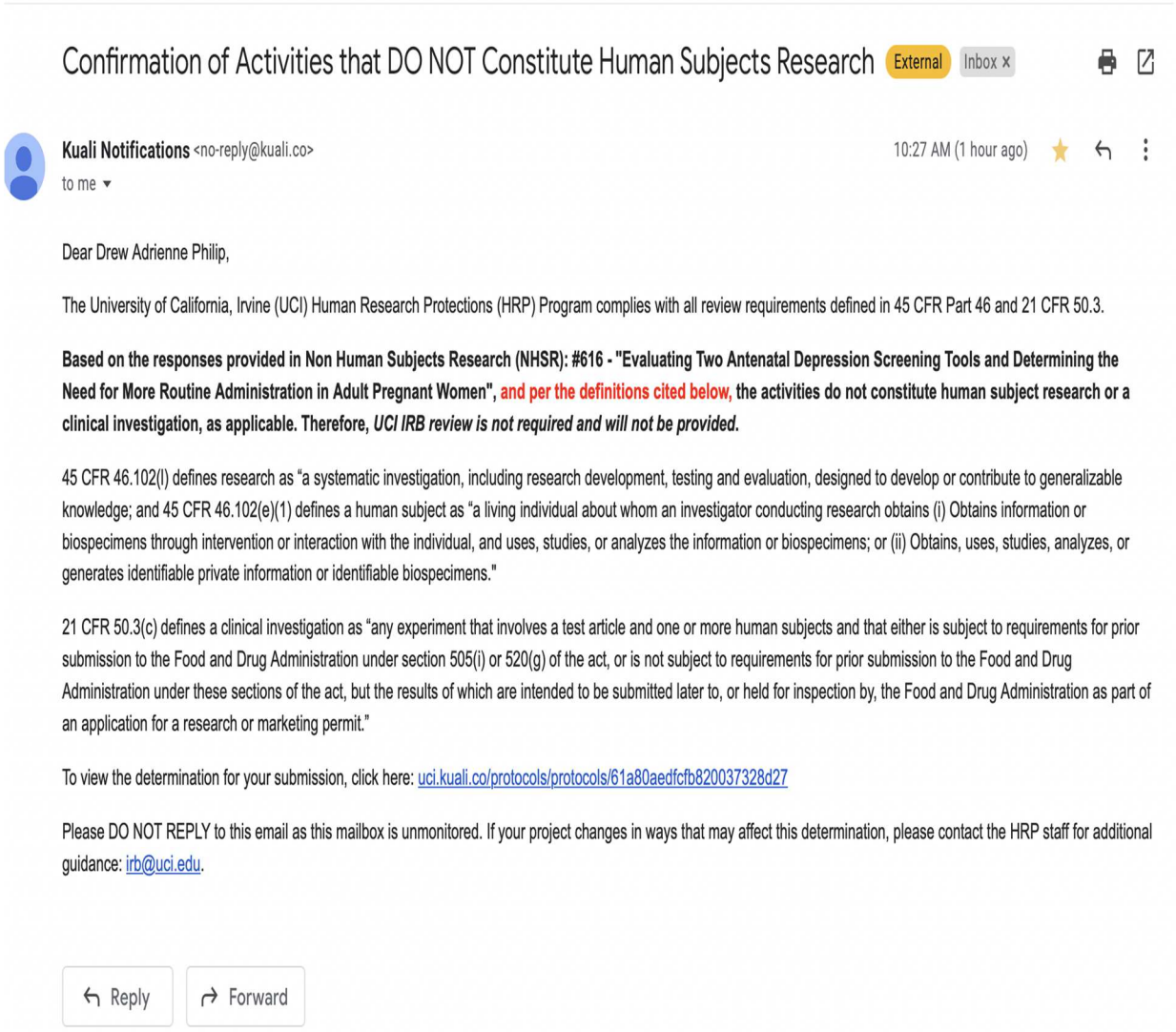
OB/GYN; MD

(Job title of authorized representative)

(Date signed) 10/11/2021

Appendix B

Kuwali Approval



Confirmation of Activities that DO NOT Constitute Human Subjects Research External Inbox ×

Kuali Notifications <no-reply@kuali.co> 10:27 AM (1 hour ago)

to me

Dear Drew Adrienne Philip,

The University of California, Irvine (UCI) Human Research Protections (HRP) Program complies with all review requirements defined in 45 CFR Part 46 and 21 CFR 50.3.

Based on the responses provided in Non Human Subjects Research (NHSR): #616 - "Evaluating Two Antenatal Depression Screening Tools and Determining the Need for More Routine Administration in Adult Pregnant Women", and per the definitions cited below, the activities do not constitute human subject research or a clinical investigation, as applicable. Therefore, *UCI IRB review is not required and will not be provided.*

45 CFR 46.102(l) defines research as "a systematic investigation, including research development, testing and evaluation, designed to develop or contribute to generalizable knowledge; and 45 CFR 46.102(e)(1) defines a human subject as "a living individual about whom an investigator conducting research obtains (i) Obtains information or biospecimens through intervention or interaction with the individual, and uses, studies, or analyzes the information or biospecimens; or (ii) Obtains, uses, studies, analyzes, or generates identifiable private information or identifiable biospecimens."

21 CFR 50.3(c) defines a clinical investigation as "any experiment that involves a test article and one or more human subjects and that either is subject to requirements for prior submission to the Food and Drug Administration under section 505(i) or 520(g) of the act, or is not subject to requirements for prior submission to the Food and Drug Administration under these sections of the act, but the results of which are intended to be submitted later to, or held for inspection by, the Food and Drug Administration as part of an application for a research or marketing permit."

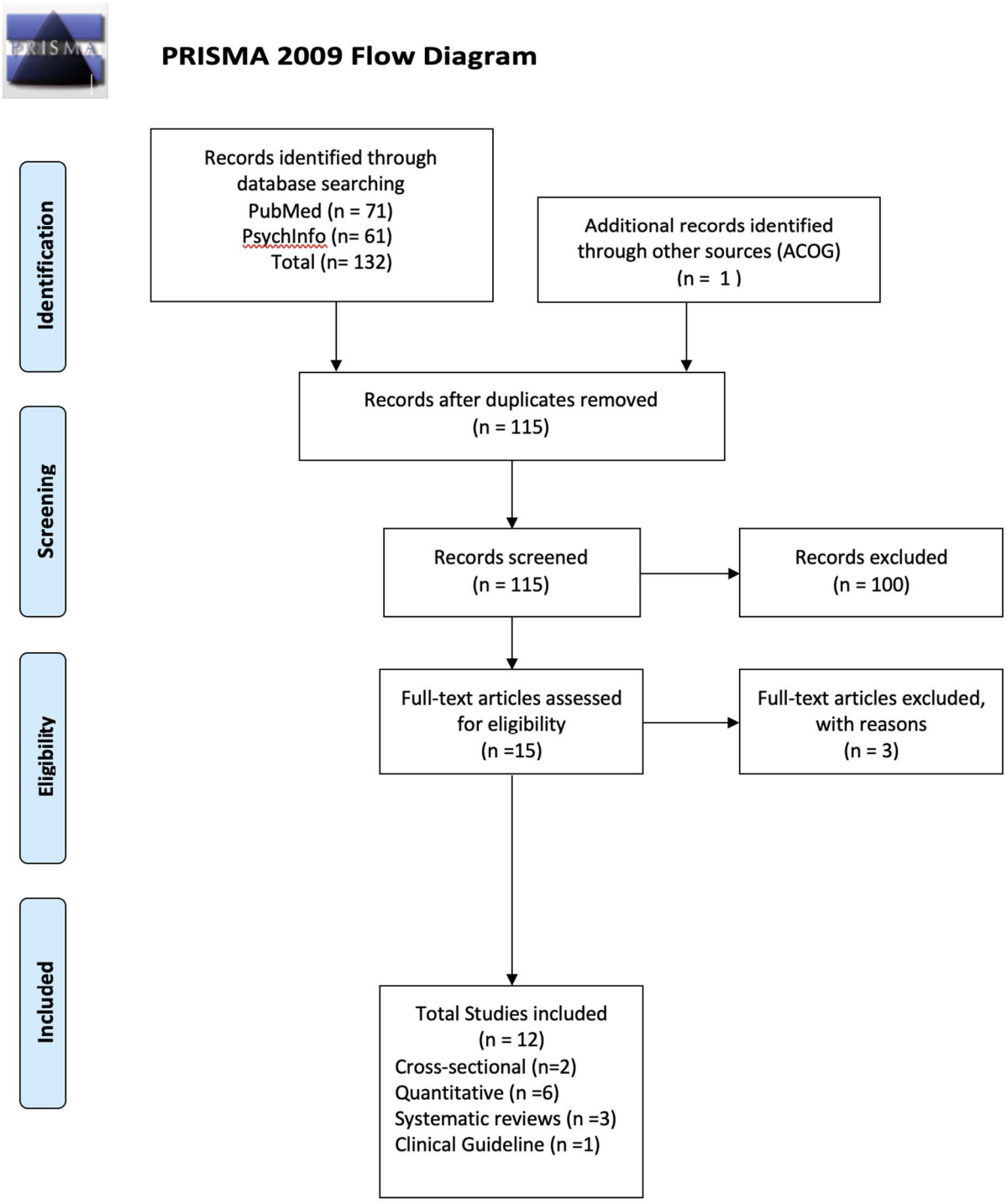
To view the determination for your submission, click here: uci.kuali.co/protocols/protocols/61a80aedfcfb820037328d27

Please DO NOT REPLY to this email as this mailbox is unmonitored. If your project changes in ways that may affect this determination, please contact the HRP staff for additional guidance: irb@uci.edu.

Reply Forward

Appendix C

Prisma Flow Diagram



Appendix D

Table of Evidence

	SOURCE (AUTHOR, DATE)	TOPIC/MAIN IDEA	POPULATION OF STUDY	Independent/Dependent Variable (*Primary Outcome)	RESULTS/CONCLUSIONS	LIMITATIONS	CONNECTION TO OTHER STUDIES	RELATION TO PICO Question
SOURCE 1	ACOG (2018) Clinical Guideline	• Clinical guideline that guides healthcare providers on how often to screen for AD and using which depression screening tools	• Pregnant women	• Independent variable is depression in pregnancy and dependent is depression screening tools (i.e., PHQ9, EDS, Beckman)	• Use a validated screening tool s (EDS and PHQ-9) to screen for antenatal depression at least once during pregnancy	• Multiple depression screening tools offered even those with lower sensitivity and specifcy in detecting antenatl depression. Also, only encourages one screening during pregnancy	• This clinical guideline serves as the standard of care that is supported through previous literature and backed by the governing body.	• This clinical guideline is imperative to my project because it is the clinical problem. Too many screening tools to choose from and frequency is only once during pregnancy which does not offer a comprehensive evaluation of antenatal depression
SOURCE 2	Bergink et. al, 2011	• Examine the predictive validity and concourrent validity of the EDS in all three trimesters of pregnancy.	• Caucasian Dutch pregnant women.	• Independent variable is the EDS and the dependent variable is the EDS score.	• Confirmation that the EDS is a valid measure for detecting depression in pregnant women.	• Only Caucasian and Dutch speaking women were included in the study. • But may not be an issue since the EDS is validated in 30 other languages.	• This study highlights that limited research has been conducted on mood and anxiety symptoms during pregnancy. • But of that research has shown that mental problems during pregnancy is associated with impaired obstetric and infant outcomes. • Addresses high prevalence of major depression rates in other studies and stresses the importances of extending findings to the general pregnant population.	• EDS is an appropriate tool to measure depression in pregnant women. • I will be able to implement the EDS during my study since it is deemed successful
SOURCE 3	Stewart et. al, 2013	• To assess antenatal depression in rural Malawi with the EPDS and the SRQ	• Pregnant Malwai women in rural antenatal clinic	• Independent variables were the EPDS and SRQ. The dependent variable was the scores of these depression screeing tools	• EDPS and SRQ both show utlity as screening measures for detection of antenatal depression in rural Malawi.	• Small sample size and study was conducted in antenatal clinic attenders only which limits generalisability to all pregnany women in this particular setting. • There was no inter-rater reliability testing.	• This study's finding that the EPDS can be used antenatally to screen for depression is consistent with other studies from high income countries. • This study showed good test characteristics of the SRQ and is similar to the previous study who also validated SRQ in an antenatal population.	• Validation that the EPDS is an accurate tool in assessing depression during pregnancy. • This particular study taught me to be mindful of potential language barriers during implementation of the EPDS.
SOURCE 4	Brancaglion et. al, 2013	• Utlizing the Edinburgh Postnatal Depresion Scale (EPDS) as a screening tool for antenatal depression.	• Pregnant women attending prenatal check up between first and six months of pregnancy.	• Independent variable is the EDS and the dependent variable is the EDS score .	•The study found that the EDPS was an interesting screening tool for antenatal depression. • Utilization of the EDPS can cause significant postive impacts through increased recognition as well as diagnosis and treatment of antenatal depression.	•Extracting data of the MINI and EPDS was not done at the same time due to mother's not wanting to complete the questionaire at the same time.	• Antepartum depression prevalance in this study was within the same margin as compared to other studies. • This study also compared sensibility and specificity of the EPDS with previous literature.	• This study reinterates the importance of screening for antenatal depression which is my motivation for my DNP project. • This study made a point that it is difficult to distinguish between distress and depression during pregnancy.
SOURCE 5	Woldentensay et. al, 2018	• To validate the 9-item Patient Health Questionaire as a screening instrument for depression in pregnant Ethiopian women.	• Pregnant women from Ethiopia during their first, second, or third trimester.	• The independent variable isthe PHQ-9 and the dependent is the score of the PHQ-9.	• PHQ-9 proved to be reliable and valid instrument • May be used to screen for major depressive disorders among pregnant Ethiopian women.	• Participants might not represent all of the Afaan Oromo speaking population in Ethopia . • Assessments were conducted through interviews due to high illiteracy.	• Factor analysis and Rasch analysis revealed that a single factor model exists among all 9 factors in the PHQ-9 in this study •This is a onsistent finding with previous studies.	• Affirmation that the PHQ-9 is valid and reliable and that I can implement it within my study in comparison to the EDS. • This study also shed light on being aware of illiteracy amongst diverse populations.
SOURCE 6	Sidebottom et. al, 2012	• To validate the PHQ-9 in pregnant women in the context of a multidimesonal screening tool.	• Pregnant women seeking prenatal care at three different community health centers.	• The independent variable is the PHQ-9 and the dependent is the score of the PHQ-9.	•PHQ-9 sensitivity and specificity rates for diagnosing depresive disorders exceeded those hypothesized. • PHQ-9 also identified pregnant women who were in distress.	• Lack of generalizability beyond pregnant women (study-specific population). • Exclusion of somatic symptoms which could have lead to underestimation of depression.	• The study uses resources that highlight the negative consequences that occur from untreated depression during pregnancy. • The study compared sensitivity and specificity rates for a diagnosis for depressive disorders in pregnant women to other studies.	• The study asked the pregnant women particpants about their basic needs and social support first before adminstering the PHQ-9. • The power of face-to-face interviews is profound and would be a great component to use in my DNP project.
SOURCE 7	Heyningen et. al, 2018	• Comparing the psychometric performance of commonly used screening tools to detect Major Depressive Episodes and anxiety .	• Pregnant women 18 years or older who are attending their first prenatal visit.	• Independent variables are different screening tools for depression and anxiety (EPDS, PHQ-9, Whooley questions, GAD-7, and K10). • The dependent variable is the scores of these screening tools.	• EPDS was the best screening instrument for detecing MDE and K10 and K6 for anxiety disorders.	• Women were only screened once which limits the comparison of screening instruments throughout the periods of pregnancy. •Only included on anxiety- symptom screening tool and did not use common anxiety-symptom screening tools. • The screening instruments where adminstered in order which could have resulted in primed responses.	• This study used previous literature to expose the reliability of the EPDS as a screening tool for antenatal depression and anxiety. • The article references other references that used different screening tools for anxiety and depression (PHQ-9, K10, GAD-7, and Whooley questions).	• More affirmation that the EPDS is the best screening instrument for detecting MDE. • This study provided knowledge on screening tools used for detecting anxiety.
SOURCE 8	Flynn et. al, 2011	• Comparing performance of Edinburgh Depression Scale and the Patient Health Questionnaire-9 in pregnant and postpartum women.	• Pregnant and postpartum women seeking outpatient psychiatric services.	• Independent variables are the EPDS and PHQ-9 and the dependent variables are the scores of these screening tools.	• The study found that there were not significant differences in the performance of the PHQ-9 and EPDS.	• Clinician DSM-IV multiaxial diagnosis were used as the gold standard to which both screening tools were compared with. • Performace scores are only generalizable. • The study did not compare the validity of these two tools as symptom monitoring or treatment responses measures.	• This study references several other sources that surround screening for antenatal and postnatal depression. • The first study to suggest minimal difference between the two screening tools.	• This study directly compares both the EPDS and the PHQ-9 which is the basis of my PICO question.
SOURCE 9	Zhong, et. al, 2014	• Comparing the performance of Edinburgh Depression Scale and the Patient Health Questionnaire-9 for screening antepartum depression.	• Pregnant women between 18-49 years of age and under 16 weeks gestation.	Independent variables are the EPDS and PHQ-9 screening tools and the dependent variables are the scores of these screening tools	Both screening tools provide good internal consistenty, construct, and validity when screening for antenatal depression in early pregnancy. However, the EPDS detects depressive symptoms along with anxiety and the PHQ-9 assesses common somatic symptoms during pregnancy. The findings suggests using the two scales together to improve identification of women who may be at risk for antenatal depression.	• The study did not have information from diagnostic interventions and not able to report validity of the two scales. • Both screening tools were given in the same order. • The validiity of items from the two scales could have been impacted by gestational age and delivery.	• This study provides an extensive list of references used to support the study. • There is a lot of evidence used to support the reasoning in the discussion portion of the study.	• This study is highly relavent to my PICO question because it compares the EPDS and PHQ-9.
SOURCE 10	Wang et al., 2021	• Determine the validity of PHQ9 in perinatal depression screen, examine convergent validity of PHQ-9 compared to other validated depression measures and compare performance to EPDS	Pregnant Women	Independent variable is the PHQ9 and dependent are the scores of the PHQ9	Good diagnostic operating characteristic as a screener for perinatal depression. Sensitivity and specificity and AUC all >0.80 and is similar to the performance of other well validated depression measures; perform comparably to EPDS	Risk bias varied among the criterion validity studies	This study provides a comprehensive analysis of the PHQ-9 validity in comparison to other depression screening tools that are well validated and used in perinatal depression screening	This study is very relatable to my PICO because it deeply looks into the validity of PHQ-9 which is the premise of my question
SOURCE 11	Kozinsky & Dudas, 2015	•Critically appraise and review antenatal validation studies of the EDS	Pregnant women across multiple individual studies	The independent variable is the EPDS and the dependent is the cut-off score of the screening tool	Trimester specific EPDS validation studies are needed in each culture instead of using non-validated cut-off scores. Generally, the EPDS is good at identifying major depression alone with low misclassification rates but perform poorer for the combined or minor depression categories. Overall, the EPDS is a valid screening tool across different cultures. The high sensitivity of the EPDS is clinically desirable screening instrument as it prevents missing a depressive disorder. Advisable to choose a cut-off score which the misclassification rate is not too high; lowering the cut-off score increases sensitivity which may make sense for established referral pathways (PCP) where the objective is to maximize detection and refer potential cases to psych	Small sample size and include both representative and clinical samples and look at psychometric performance of EPDS in each trimester	Very helpful article which is connected to other studies even used in this literature review due to its findings of lowering the cut off score to increase sensitivity.	This study relates to my PICO because it critical appraised validation studies of the EPDS for antenatl depression; which disocvered that cut-off scores be lowered for better sensitivity in minor depression in pregnancy
SOURCE 12	Levis et al., 2020	• Evaluating EPDS for screening to detect major depression in pregnant and postpartum women	Pregnant women from 58 of 83 eligible studies	The independent variable is the EPDS and the dependent variable is the score of the EPDS	An EPDS cut-off value of 11 or higher maximised combined sensitivity and specificity; a cut-off value of 13 or higher was less sensitive but more specific. To identify pregnant and postpartum women with higher symptom levels, a cut-off of 13 or higher could be used. Lower cut-off values could be used if the intention is to avoid false negatives and identify most patients who meet diagnostic criteria.	Not able to obtain 25 of the 83 articles that were eligible, moderate heterogeneity was found across studies, and no subgroup analysis based on cultural aspects	Contribute to other studies because of the identification of ideal cut-off scores for the EPDS.	This study also contributes to my PICO question because it looks at how well the EPDS screens pregnant women for depression. Also it helps determine an approprioate cut off score dependent on symptoms

Appendix E

Clinical Guideline Apprasial

DOMAIN 1. SCOPE AND PURPOSE

1. The overall objective(s) of the guideline is (are) specifically described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
☑	☐	☐	☐	☐	☐	☑

Comments

2. The health question(s) covered by the guideline is (are) specifically described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
☐	☐	☐	☐	☐	☐	☑

Comments

3. The population (patients, public, etc.) to whom the guideline is meant to apply is specifically described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
☐	☐	☐	☐	☐	☐	☑

Comments

DOMAIN 2. STAKEHOLDER INVOLVEMENT

4. The guideline development group includes individuals from all relevant professional groups.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
☐	☐	☐	☐	☐	☐	☑

Comments

5. The views and preferences of the target population (patients, public, etc.) have been sought.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
☐	☐	☐	☐	☐	☐	☑

Comments

6. The target users of the guideline are clearly defined.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
☐	☐	☐	☐	☐	☐	☑

Comments

DOMAIN 3. RIGOUR OF DEVELOPMENT

7. Systematic methods were used to search for evidence.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
☐	☐	☐	☐	☐	☑	☐

Comments

8. The criteria for selecting the evidence are clearly described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
☐	☐	☐	☐	☐	☑	☐

Comments

9. The strength and limitations of the body of evidence are clearly described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
☐	☐	☐	☐	☐	☑	☐

Comments

10. The methods for formulating the recommendations are clearly described.

1 Strongly Disagree	2	3	4	5	6	7 Strongly Agree
☐	☐	☐	☐	☑	☐	☐

Comments

11. The health benefits, side effects, and risks have been considered in formulating the recommendations.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

12. There is an explicit link between the recommendations and the supporting evidence.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments
They list how the other screening tools such as Beckman Inventory are less sensitivite in detecting antenatal depression.

13. The guideline has been externally reviewed by experts prior to its publication.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

14. A procedure for updating the guideline is provided.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

DOMAIN 4. CLARITY OF PRESENTATION

15. The recommendations are specific and unambiguous.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

16. The different options for management of the condition or health issue are clearly presented.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

17. Key recommendations are easily identifiable.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

DOMAIN 5. APPLICABILITY

18. The guideline describes facilitators and barriers to its application.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

19. The guideline provides advice and/or tools on how the recommendations can be put into practice.

1 Strongly Disagree	2	3	4	5 ✔	6	7 Strongly Agree

Comments
At least once during the perinatal period not specifically during actual pregnancy

20. The potential resource implications of applying the recommendations have been considered.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

21. The guideline presents monitoring and/or auditing criteria.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

DOMAIN 6. EDITORIAL INDEPENDENCE

22. The views of the funding body have not influenced the content of the guideline.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

23. Competing interests of guideline development group members have been recorded and addressed.

1 Strongly Disagree	2	3	4	5	6 ✔	7 Strongly Agree

Comments

OVERALL GUIDELINE ASSESSMENT

For each question, please choose the response which best characterizes the guideline assessed:

1. Rate the overall quality of this guideline.

1 ☐ Lowest possible quality	2 ☐	3 ☐	4 ☐	5 ☐	6 ☑	7 ☐ Highest possible quality

2. I would recommend this guideline for use.

YES	☐
YES, With modifications	☑
NO	☐

NOTES

Only modification I would make is to expand the screening of perinatal depression since the guideline only encourages providers to screen once during this time. I would also not encourage the use of other tools outside of the PHQ-9 and EDS since they are more sensitive then the other screening tools listed as highlighted even within the clinical guideline.

Appendix F

Pre-implementation, Implementation, Post-implementation Surveys

Pre AD DNP Project Survey

Roles and Responsibilities

1. I under that the PHQ-9 and EDS is to be administered in the first or second trimester for the initial screening and be given to Dr. Speir for analysis.

- ◯ Yes
- ◯ No

2. I understand that the PHQ-9 and EDS is to be administered in the second or third trimester for second screening and given to Dr. Speir for analysis.

- ◯ Yes
- ◯ No

3. I understand that screening of the clinical schedule needs to be performed to evaluate participants who were eligible for AD screening (i.e., 18 years or older, first, or second trimester)

- ◯ Yes
- ◯ No

4. Communication was established with the front desk office about next appointment that was scheduled during the second screening interval time period?

- ◯ Yes
- ◯ No

6. I believe I can accomplish these roles and responsibilities to the best of my ability.

- ◯ Yes
- ◯ No

Implementation AD DNP Project Survey

1. Was the PHQ9 and EDS administered in the first trimester OR second trimester for INITAL screening?

- ◯ Always
- ◯ Sometimes
- ◯ Never

2. Was the PHQ9 and EDS was administered in the second trimester OR third trimester for the SECOND consecutive screening?

- ◯ Always
- ◯ Sometimes
- ◯ Never

3. I have been appropriately screening pregnant patients who meet criteria (i.e. 18 or older and first or second trimester)

- ◯ Always
- ◯ Sometimes
- ◯ Never

4. Communication is established/ongoing with front desk office about consecutive antenatal depression screening to help facilitate the second interval screen?

- ◯ Always
- ◯ Sometimes
- ◯ Never
- ◯ Other

5. If an adult pregnant patient screened positive, they were further investigated and offered a medical intervention if deemed necessary.

- ◯ Always
- ◯ Sometimes
- ◯ Never
- ◯ Other

Post AD DNP Project Survey

1. Was the PHQ9 and EDS administered in the first trimester OR second trimester for INITAL screening?

- ◯ Always
- ◯ Sometimes
- ◯ Never

2. Was the PHQ9 and EDS was administered in the second trimester OR third trimester for the SECOND consecutive screening?

- ◯ Always
- ◯ Sometimes
- ◯ Never

3. I have been appropriately screening pregnant patients who meet criteria (i.e. 18 or older and first or second trimester)

- ◯ Always
- ◯ Sometimes
- ◯ Never

4. Communication was established with the front desk office about the patient's next appointment during the second screening interval time period?

- ◯ Always
- ◯ Sometimes
- ◯ Never
- ◯ Other

5. If an adult pregnant patient screened positive, they were further investigated and offered a medical intervention if deemed necessary.

- ◯ Always
- ◯ Sometimes
- ◯ Never
- ◯ Other

6. I encountered minimal barriers (i.e., missed screening intervals, patient resistance, etc) while implementing this project.

- ○ Yes
- ○ No
- ○ Occasionally

7. I believe I accomplished my roles and responsibilities in this project to the best of my ability.

- ○ Yes
- ○ No

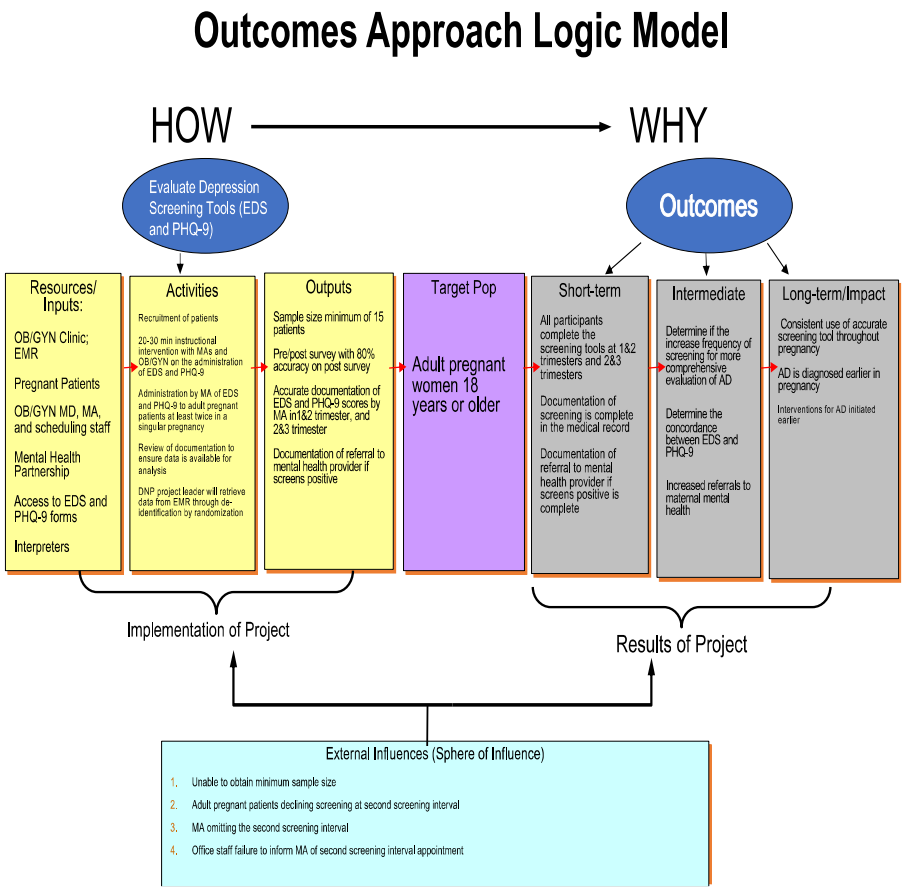
8. What could be improved to help facilitate a better implementation of this project in the future?

- ○ Explain:

LIST OF FIGURES

Figure 1

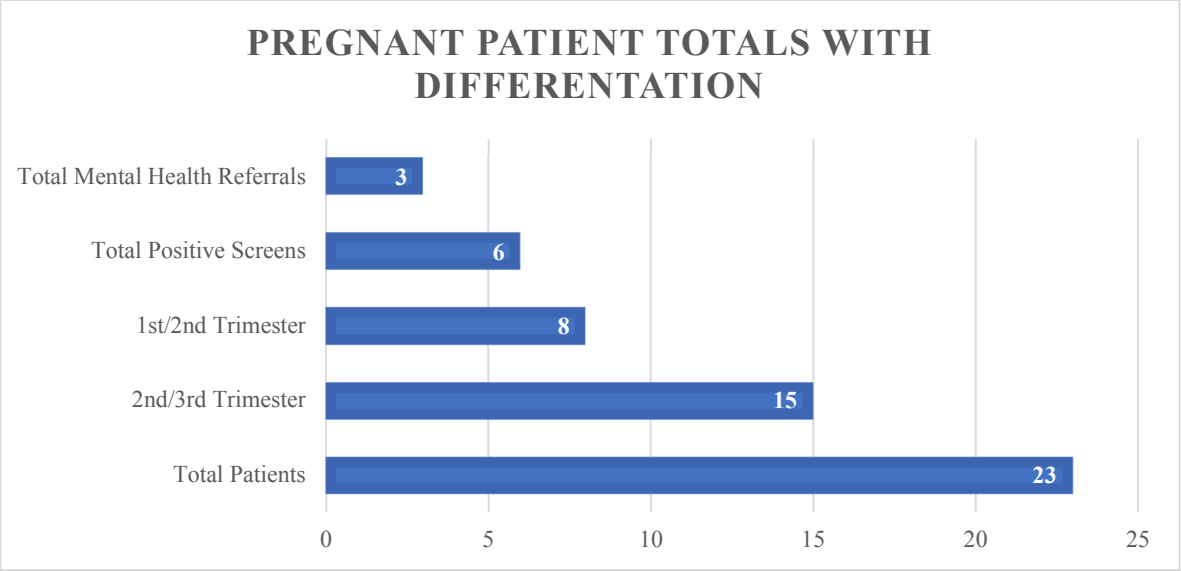
Outcomes Approach Logic Model



Note. This diagram explains in details the necessary requirements needed for the implementation of this DNP project in order to meet the ideal outcomes.

Figure 2

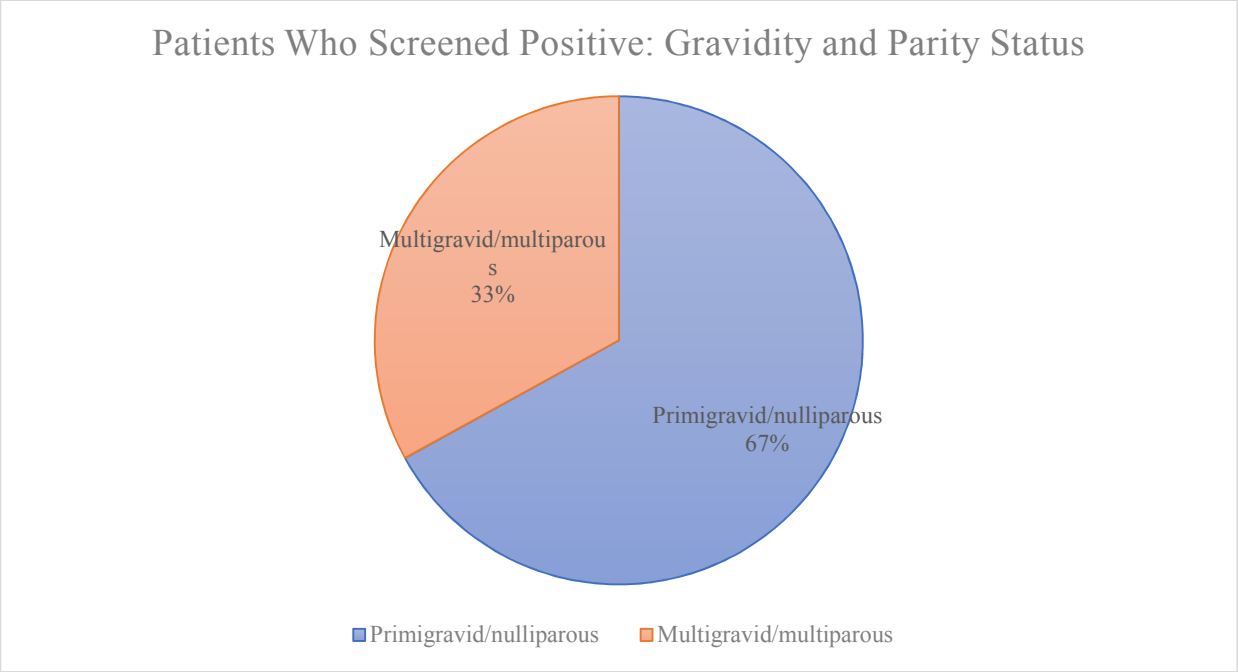
Pregant Patient Totals with Differentation



Note. This graph displays that 23 patients were screened during the DNP project. Fifteen patients were screened in the first and second trimester. Eight were screened in the second and third trimester. This graph also displays that six patients screened postivie for antenatal depression and three were referred to a mental health provider.

Figure 3

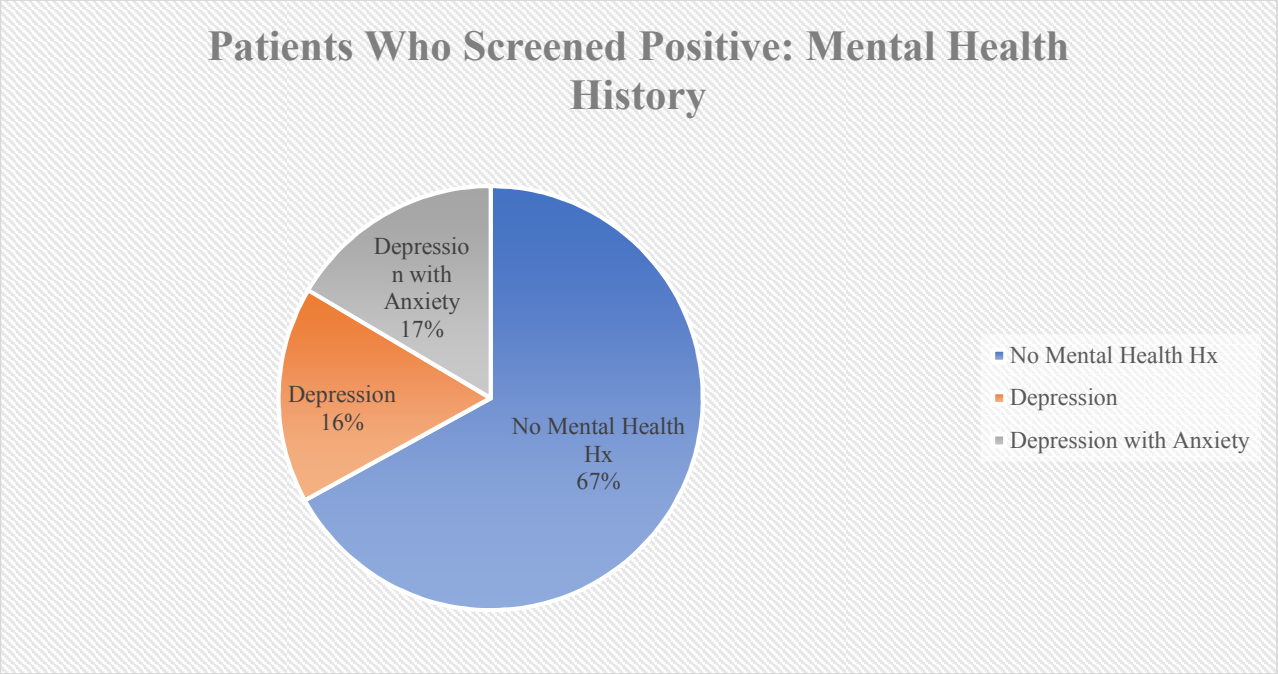
Patients Who Screened Positive: Gravidity and Parity Status



Note. This diagram displays that 67% of the patients who screened positive for antenatal depression were primigravid/nulliparous and 33% were multigravid/multiparous.

Figure 4

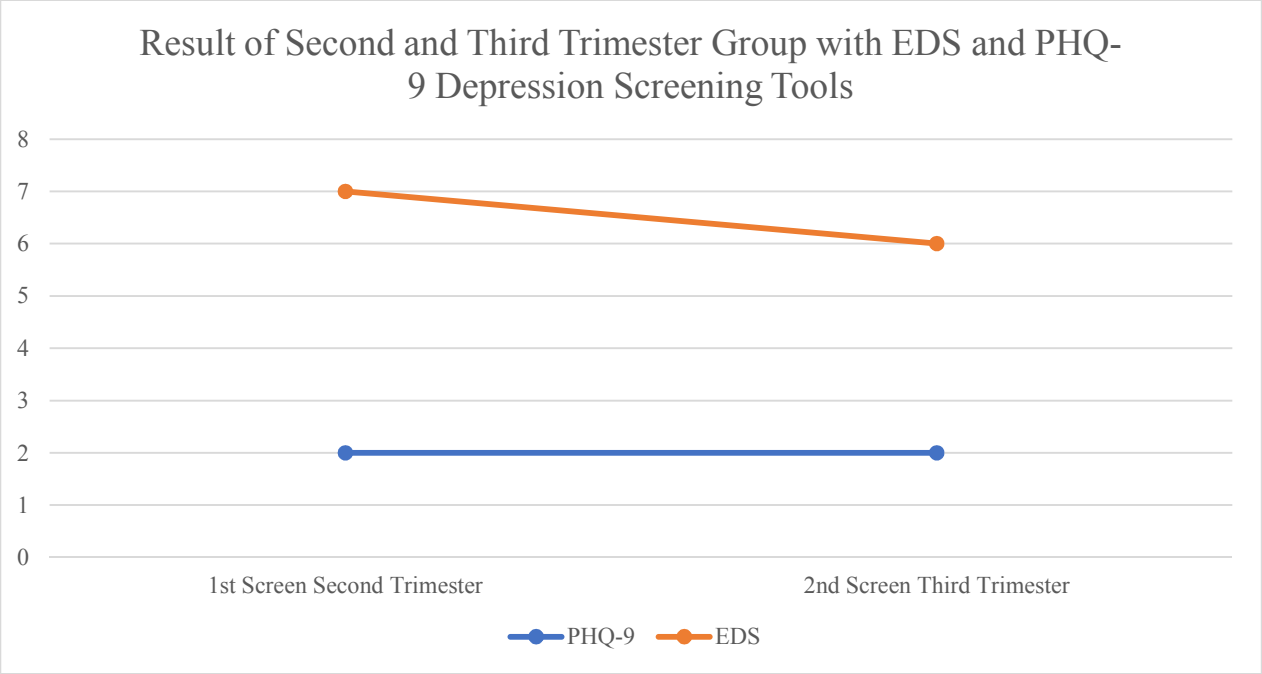
Patients Who Screened Positive: Mental Health History



Note. This diagram explains that 67% of patients who screened positive had no mental health history. It also displays that 17% of patients who screened positive had a mental health history of depression with anxiety and that 16% had a mental health history of only depression.

Figure 5

Result of Second and Third Trimester Group with EDS and PHQ-9 Depression Screening Tools



Note. This graph explains that two patients screened positive in the second trimester and also screened positive in the third trimester during the consecutive screen using the PHQ-9. It also displays that seven patients screened positive in the second trimester screen, and six screened positive in the third trimester consecutive screen with the EDS.