

IMPLEMENTATION OF A SCREENING AND MANAGEMENT PROTOCOL FOR
PERINATAL ANXIETY IN FAMILY MEDICINE CLINICS

By

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ABSTRACT

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Depression has been the predominant focus of perinatal mental health research. However, anxiety rates may be equal to or exceed that of depression during the perinatal period. Perinatal anxiety is associated with adverse birth outcomes such as pre-term and low birth weight for infants. These outcomes may be exacerbated for women of ethnic/racial minority status and/or socioeconomic disadvantage. Thus, research reveals a need for the development of anxiety protocols for perinatal women during routine healthcare visits. The current study takes place in three family medicine clinics that follow a stepped, collaborative care model. A perinatal anxiety screening and care management protocol was developed and implemented. The protocol was implemented through a brief training for practitioners and automatic screening reminders in patients' electronic health records. Rates of perinatal anxiety among patients and providers' anxiety screening rates after implementation were examined. Ethnicity is examined to determine if it is a significant predictor of receiving anxiety screening. Finally, facilitators and barriers to the protocol were assessed using qualitative methods and data gathered from family medicine residents.

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CHAPTER I: INTRODUCTION

Statement of the Problem

Women are at a higher risk for mental health problems such as depression and anxiety during their reproductive years (Ko, Farr, Dietz, & Robbins, 2012). However, pregnant and postpartum women often go undiagnosed for depression and anxiety (Ko et al., 2012; National Institute for Health & Care Excellence, 2014). Depression and anxiety are comorbid in perinatal populations (Heron, O'Connor, Evans, Golding, & Glover, 2004; Kessler, Chiu, Demler, & Walters, 2005; O'Hara & Swain, 1996; Stuart, Couser, Schilder, O'Hara, & Gorman, 1998), and there is evidence that anxiety may be more common than depression during pregnancy, occurring at similar rates after birth (Brockington & Macdonald, 2006; Fairbrother et al., 2016; Matthey, Barnett, Howie, & Kavanagh, 2003).

In one study, Paul and colleagues (2013) examined a sample of 1,123 predominantly white postpartum women recruited during hospital discharge and found 17% screened for anxiety using the State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970) measure of anxiety, while only 6% screened for depression using the Edinburgh Postnatal Depression Scale (EPDS). Additionally, women who screened above the cut-off for anxiety were more likely to have cesarean delivery, less breastfeeding time, and increased maternal healthcare utilization. In another study of anxiety and depression of postpartum women, a convenience sample was collected and analyses revealed that 10% had symptoms of anxiety and distress according to the Depression, Anxiety, and Stress Scale (DASS-21; Miller et al., 2006). In a sample of 310 Canadian women, researchers used the Generalized Anxiety Disorder Scale (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006) for anxiety and EPDS for depression followed by diagnostic interviews (Fairbrother et al., 2016). The reported prevalence of perinatal

anxiety disorders was 17.4%, while depression was at 6.5% (Fairbrother et al., 2016). A convenience sample of perinatal women receiving obstetric care at a teaching hospital were screened using the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) and portions of the Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001) for anxiety. Analyses indicated that 23% of women screened positive for anxiety or depressive symptoms at obstetric visits during the third trimester of pregnancy and 17% screened positive postpartum (Goodman & Tyler-Viola, 2010). Researchers also looked at electronic health records and found that 76% of prenatal women and 72.5% of postnatal women who screened positive for depression and/or anxiety did not receive any form of mental health treatment (i.e., psychotherapy, medication, or both).

It is imperative to appropriately screen and manage perinatal anxiety in healthcare settings, particularly because of the associated adverse outcomes for the mothers and children. Variables such as, socioeconomic disadvantage, low educational status, a history of poor mental health, adverse circumstances around pregnancy and birth, as well as poor quality relationships are all risk factors for anxiety disorders during the perinatal period (Leach et al., 2017; Martini et al., 2015). Further, antenatal anxiety is associated with daily stressors and obstetric complications (Macbeth & Luine, 2010). Those women with high-risk pregnancies are also more likely to experience anxiety disorders (Fairbrother, Young, Zhang, Janssen, & Antony, 2017). Perinatal anxiety affects the developing fetus with later adverse outcomes for the child. A plethora of child health problems related to perinatal anxiety exist, including later cognitive, physiological, emotional, and behavioral problems (Brouwers, van Baar, & Pop, 2001b; Field, 2017; O'Connor, Heron, Golding, Beveridge, & Glover, 2002; O'Connor et al., 2005; van Batenburg-Eddes et al., 2009; Weisberg & Paquette, 2002). More research is needed for both

minority and socioeconomically disadvantaged women as they may be at higher risk for perinatal mood disorders and obstetric complications (Buescher & Mittal, 2006; Nabukera et al., 2009).

Although research has been conducted on the prevalence and adverse outcomes of perinatal anxiety, it is important to begin to examine perinatal anxiety screening in healthcare settings. The majority of studies on screening in healthcare settings have focused on postpartum depression, and practices have been successful in increasing follow-up care (Coates, de Visser, & Ayers, 2015). Healthcare screenings for anxiety are often overlooked. As a result, women often go undetected for anxiety disorders during perinatal checkups in healthcare clinics (Ford et al., 2017; Ford et al., 2016). The majority of research on perinatal screening has been conducted in hospital or OB/GYN settings with predominantly white, middle-class populations. Since minority and socioeconomically disadvantaged women may be at higher risk for adverse birth outcomes (Leach et al., 2017), and less likely to have provider follow-up after screening (Avalos et al., 2016), more research on screening and management among this population is needed. The current study will take place in a family health clinic that attracts racial/ethnic minority and socioeconomically disadvantaged perinatal women.

Anxiety Screening Measures

While screening and management protocols have become more commonplace for perinatal depression, measures for perinatal anxiety have been neglected in routine healthcare screenings. According to the National Institute for Health and Care Excellence (NICE; 2014), the two and seven item Generalized Anxiety Disorder Scales (GAD-2 and GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006), are recommended for perinatal anxiety screening during healthcare visits. Additionally, the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) commonly used for screening perinatal depression, has a subscale of three

items that can be used to measure anxiety. Most research studying perinatal anxiety outcomes has used the State Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, & Lushene, 1970), however not for routine healthcare screenings as the measure is lengthy with 40 questions total.

GAD-2 and GAD-7. The Generalized Anxiety Disorder Scale (GAD-2 and GAD-7; Spitzer et al., 2006; see Appendix D), has been recommended by NICE guidelines for perinatal anxiety screening (2014). The GAD-2 is used as a preliminary screener, with a more in-depth instrument, the GAD-7, for those with positive results of three or more (NICE, 2014). A cut-off score of ten has yielded a sensitivity of 89% and specificity of 82% for predicting diagnoses of Generalized Anxiety Disorder (GAD) in a sample of primary care patients (Spitzer et al., 2006). The GAD-7 has been studied in populations of perinatal women with sensitivity of 61.3% and specificity of 72.7% for predicting a diagnosis of GAD (O'Hara et al., 2012; Simpson et al., 2014). Additionally, the brevity of the tool makes it feasible to implement into routine healthcare screenings for perinatal women.

Edinburgh Postnatal Depression Scale. The commonly used Edinburgh Postnatal Depression Scale (EPDS; see Appendix C) for depression screening has an anxiety subscale, the EPDS-3A (Matthey, 2008). Researchers revealed that the EPDS-3A can reliably distinguish anxiety from depression in populations of perinatal women, using exploratory factor analysis and a two-factor structure, including depression and anxiety (Jomeen & Martin, 2005; Matthey, 2008; Matthey, Fisher, & Rowe, 2013; Phillips, Charles, Sharpe, & Matthey, 2009; Swalm, Brooks, Doherty, Nathan, & Jacques, 2010). However, some studies revealed that the full EPDS scale screens just as well for anxiety as the EPDS-3A and may therefore not adequately differentiate anxiety and depression (Grigoriadis et al., 2011; Matthey et al., 2013; Muzik et al., 2000; Rowe, Fisher, & Loh, 2008). In a recent study, Stasik-O'Brien and colleagues (2017) used

the established cut-off for anxiety disorders of ≥ 6 and found that 23.3% of women in a neonatal intensive care unit screened positively for anxiety but were not above the overall EPDS cut-off for depression. These women would have been therefore missed during routine depression screenings. Therefore, although the EPDS is widely used for depression screenings, it is unlikely that physicians are using the EPDS-3A subscale for the purpose of screening for anxiety.

GAD-2, GAD-7, and EPDS-3A. The mixed results of the EPDS-3A means it may be suboptimal for routine screening of perinatal anxiety (Muzik et al., 2000; Rowe et al., 2008; Stasik-O'Brien, McCabe-Beane, & Segre, 2017). In perinatal populations, the GAD-7 may surpass both the EDPS and the EPDS-3A subscale in screening for anxiety (Simpson, Glazer, Michalski, Steiner, & Frey, 2014). In a study of 240 perinatal women referred for psychiatric consultation, clinical diagnoses of GAD were compared to both the EPDS-3A and GAD-7 (Simpson et al., 2014). Compared to both the overall EPDS and EPDS-3A subscale, the GAD-7 had greater sensitivity (61.3%) and specificity (72.7%) (Simpson et al., 2014). The GAD-2 and GAD-7 are not only recommended by NICE (2014) guidelines for perinatal anxiety screening, but are also simple and quick to administer and assess, making it feasible to administer during routine healthcare screenings. Further, the GAD-7 has been studied more extensively than the EPDS-3A in underserved and minority populations (García-Campayo et al., 2010; Howell, Bodnar-Deren, Balbierz, Parides, & Bickell, 2014). However, more research is needed in the perinatal population with this specific measure.

State Trait Anxiety Inventory. Numerous studies on perinatal anxiety predictors, outcomes, and screenings have used the STAI (Spielberger, Gorsuch, & Lushene, 1970) to measure anxiety (Spielberger, Gorsuch, & Lushene, 1970). However, rather than in the context of routine healthcare screenings, this measure has been predominately used to examine

determinants and outcomes of perinatal anxiety. While this screening tool may be a reliable and valid measure of anxiety, it has a total of 40 questions, making it potentially unfeasible and burdensome to use in routine healthcare screenings by physicians. Further, for perinatal populations, questions such as “I feel relaxed” and “I tire quickly” may be typical pregnancy and postpartum features, potentially confounding results (Ayers, Coates, & Matthey, 2015).

Mental Health Screening

The U.S. Preventative Task Force recommends universal screening of perinatal depression when supports and follow-up are in place (Siu et al., 2016; U.S. Preventative Task Force, 2009). Evidence exists that universal screening and management improves accurate identification in the primary care setting, which leads to receipt of treatment for cases that would have otherwise been overlooked (Siu et al., 2016; U.S. Preventative Task Force, 2009). While research is lacking on perinatal anxiety screening, potential guidelines can be gleaned from research on perinatal depression screening.

Quantitative methodology has been used to evaluate universal perinatal depression screening programs, with a focus on rates of detection, diagnosis, and treatment (Keesara & Kim, 2018; Leung et al., 2010; Miller, Shade, & Vasireddy, 2009; Myers et al., 2013; O'Hara, 2009; Olin et al., 2016; Yawn, Dietrich, et al., 2012; Yawn, Olson, et al., 2012). In one study of a universal perinatal depression screening program, women who had at least one obstetric visit during pregnancy or postpartum were examined retrospectively during three phases of implementation of the program (Avalos, Raine-Bennett, Chen, Adams, & Flanagan, 2016; Flanagan & Avalos, 2016). The program consisted of brief psychoeducation on depression, support groups, and individual therapy. Data were collected from electronic health records and analyses revealed 1% of women were screened for depression at least once during pre-

implementation compared to 97.5% after full implementation, with women being screened an average of 2.5 times during pregnancy after implementation. Additionally, results indicate significant improvements in depressive symptoms post-diagnosis in the full implementation phase (Avalos et al., 2016).

NICE guidelines for perinatal anxiety screening and management recommend a protocol embedded in a collaborative care setting and stepped care framework (Archer et al., 2012; NICE, 2014; van't Veer-Tazelaar et al., 2009). Collaborative care is the integration of mental health into the primary healthcare setting, often utilizing psychiatric consultation for mental health management (Unützer et al., 2002). Collaborative care is a form of integrated care. At the highest level of integrated care, a mental health consultant is typically on-site in order to provide a unified medical and behavioral health treatment plan (Blount, 2003; Marlowe, Hodgson, Lamson, White, & Irons, 2014). Stepped care is a framework often used in conjunction with a collaborative or integrated care model, which consists of low-intensity intervention as the first line of treatment, while “stepping up” to more intense interventions as needed (see Table 1.1 and Figure 1). The stepped care treatment model is helpful to address barriers of mental health screening in routine healthcare visits, including optimizing time and economic resources by utilizing the lowest intensity treatment and increasing interventions for those at most risk. In the context of postpartum depression, Gjerdingen and colleagues (2009) conducted a randomized controlled trial (RCT) in which women were randomized to either stepped care or usual care. Multivariate analysis of variance was used to determine engagement in treatment, duration of treatment, as well as awareness of depression diagnosis (2009). Researchers found that stepped care intervention significantly increased engagement in treatment, duration of treatment, and awareness of diagnoses. While studies have made an important contribution to the perinatal

depression literature, they solely focused on depression, and most often in the postpartum period, making it imperative to examine and implement anxiety screening during routine healthcare visits in the pre- and postnatal period.

Implementation Framework

In order to adequately examine perinatal screening protocols and methods of implementing them in real-world healthcare settings, a model of implementation must be used. Implementation science seeks to answer the question of *how* interventions are translated from a practical standpoint (Polaha & Nolan, 2014). This is particularly important since evidence-based interventions often originate in academic settings, where experimental conditions may be more ideal, but can result in interventions being less translatable to community settings (Polaha & Nolan, 2014). Further, funding sources may not be available in the long-term, preventing the sustainability of interventions in real-world settings (Shediac-Rizkallah & Bone, 1998).

RE-AIM (Glasgow, Vogt, & Boles, 1999) is an evaluation framework that originated in the public health setting and has been used extensively to evaluate the implementation of evidence-based practices to real-world settings, including collaborative care programs. RE-AIM evaluation domains consist of Reach, Efficacy or Effectiveness, Adoption, Implementation, and Maintenance components (Glasgow et al., 1999). The Reach domain emphasizes individual level participation and demographic criteria (Glasgow et al., 1999). This includes the proportion of those who participated in the intervention compared to those who did not, as well as assessing representativeness to understand how interventions reach those in most need. The Efficacy or Effectiveness domain refers to the individual patient level by examining potential positive and negative consequences of an implemented program (Glasgow et al., 1999). This includes outcomes of participants, as well as economic outcomes. The Adoption domain is focused more

on the organizational setting and how implementation is handled during adoption of the program. The Implementation domain of RE-AIM refers to studies examining the extent to which the intervention is implemented as intended, such as practitioners' abilities to deliver intervention components consistently and through routine practice (Glasgow et al., 1999). Finally, the Maintenance domain refers to both individual and organizational levels with a focus on how the program can be sustained after the research phase, when formal implementation is complete.

The Current Study

In the proposed study, a perinatal anxiety screening and follow-up protocol was implemented in three family medicine clinics without a pre-existing formal anxiety screening protocol. The clinics operate from a stepped, collaborative care framework and they follow a perinatal depression screening protocol that involves using the EPDS to screen for depression during routine healthcare visits. A screening and care management protocol for anxiety in the perinatal period was developed based on the literature and implemented following stepped care clinical guidelines. This included providing a 60-minute training session for family medicine residents who were trained to implement an anxiety-specific screening tool (i.e., GAD-2 screener and GAD-7). Rates of perinatal anxiety as well as anxiety screening rates post-implementation were examined. Ethnicity was examined to determine if it was a significant predictor of anxiety screening. Finally, facilitators and barriers to the protocol were assessed via qualitative methods and data gathered from family medicine residents.

While all aspects of the implementation RE-AIM evaluation framework are important, in the current study, the effectiveness, reach, and adoption domains will be the focus. In order to examine effectiveness, the perinatal screening and management outcomes, specifically rates of anxiety screening pre- and post-implementation, were analyzed. For adoption, the willingness

and feasibility of practitioners to follow the perinatal anxiety screening and management protocol implemented were assessed. Qualitative interviews and surveys have been cited as a useful way to measure these domains (Glasgow et al., 1999; Wozniak et al., 2015a), and is an approach that was used in this study. Further, reach was examined to determine if race/ethnicity predicts receipt of screening. The research questions for this study are as follows:

Research Questions

1. What percent of perinatal women screen positive for anxiety during routine healthcare visits using the GAD-7?
2. What is the effectiveness of the implementation of a perinatal anxiety screening protocol in three family medicine clinics?
 - a. What is the anxiety screening rate pre and post-implementation?
 - b. What is the rate of screening for depression pre-implementation?
3. Among perinatal women who attended health visits in the three months following implementation, does race/ethnicity predict receipt of anxiety screening?
4. What are the views of providers in three family medicine clinics on implementing perinatal anxiety screening and care management, including facilitators and barriers of screening in general and those specifically related to the new practice being implemented?

CHAPTER II: LITERATURE REVIEW

Researchers found that a previous history of an anxiety disorder may be a greater risk factor for having a postnatal mood disorder than a history of a depressive disorder (Liabsuetrakul, Vittayanont, & Pitanupong, 2007; Matthey et al., 2003). Women with anxiety are also less likely to seek professional help compared to those with depressive symptoms (Woolhouse, Brown, Krastev, Perlen, & Gunn, 2009). However, the majority of studies on perinatal mood disorders have saturated postpartum depression as opposed to anxiety. This may force women to only identify with PPD, even though it may not fit their symptoms and their form of emotional distress may go unrecognized by healthcare providers (Coates, de Visser, & Ayers, 2015). Research also suggests that women with anxiety during the perinatal period are at greater risk for postnatal depression. Obstetrical complications such as preterm and low birth weight birth outcomes highlighting the need to address this important public health problem for women and children (Agius, Xuereb, Carrick-Sen, Sultana, & Rankin, 2016; Ding et al., 2014; Russell, Fawcett, & Mazmanian, 2013).

Operational Definition of Perinatal Anxiety

In the literature, anxiety during antenatal (prior to birth) and postnatal (after birth) periods includes diagnoses of generalized anxiety disorder (GAD), obsessive compulsive disorder (OCD), post-traumatic stress disorder (PTSD), panic disorders, phobias, and other non-specified anxiety disorders (American Psychiatric Association, 2013; NICE, 2014). GAD and OCD are the most common types of perinatal anxiety disorders (Pawluski, Lonstein, & Fleming, 2017). These anxiety disorders can exist alone or may be comorbid with other mental health problems. In the current literature review, perinatal anxiety does *not* refer to pregnancy-specific anxiety, which is operationalized as particular fears about pregnancy (Lobel et al., 2008). Additionally, while the

operational definition of “perinatal” is mixed, literature on antenatal and postnatal mood disorders such as anxiety, refer to perinatal when studying a wide time range of both antepartum and postpartum populations. In fact, the American College of Obstetricians and Gynecologists (ACOG) defined “perinatal depression,” as depressive episodes that occur during pregnancy or within the first 12 months after delivery (ACOG, 2015). Further, according to the British Columbia Reproductive Health’s evidence based guidelines (Williams et al., 2014), “perinatal” is defined as conception through the first year postpartum as well. Therefore, in the current literature review, the term “perinatal” means any time during both the antenatal and postnatal period, from conception through the first year postpartum.

Determinants, Costs, and Complications of Perinatal Anxiety

Researchers revealed that stress, low self-esteem, feeling unsure or unhappy about pregnancy, low self-mastery, and low levels of social support from a partner or family are significantly associated with anxiety during pregnancy (Akiki, Avison, Speechley, & Campbell, 2016; Biaggi, Conroy, Pawlby, & Pariante, 2016; Dennis, Brown, Falah-Hassani, Marini, & Vigod, 2017). Additionally, socioeconomic disadvantage, low educational status, a history of poor mental health, adverse circumstances around pregnancy and birth, as well as poor quality relationships are all risk factors for anxiety disorders during the perinatal period (Leach et al., 2017; Martini et al., 2015). Further, antenatal anxiety is associated with smoking, daily stressors, and obstetric complications (Macbeth & Luine, 2010). In particular, anxiety during pregnancy can predict whether or not the baby will be preterm and/or low birth weight (Ding et al., 2014; Liou et al., 2016). Women with high-risk pregnancies are also more likely to experience anxiety disorders overall (Fairbrother, Young, Zhang, Janssen, & Antony, 2017). Perinatal anxiety has been associated with increased healthcare utilization (Paul et al., 2013). In 2016, estimated costs

of perinatal anxiety per mother in the UK, translated to U.S. dollars, was approximately \$6,171 for health and social care, \$7,855 for productivity losses, and \$15,677 for health-associated quality of life losses (Bauer, Knapp, & Parsonage, 2016). Total lifetime costs of perinatal anxiety per woman are expected to reach \$49,725 (Bauer et al., 2016). These impacts include costs of child emotional, behavioral, and physical problems, since infant and child health is inevitably affected by maternal anxiety (Bauer et al., 2016).

Effects of Perinatal Anxiety on Parent-Child Interactions and Families

Perinatal anxiety influences the maternal-child bond. Even before birth, maternal anxiety is associated with less fetal gross body movement in sleep and adverse changes in fetal heart rate (Berle et al., 2005; DiPietro, 2010; Groome, Swiber, Bentz, Holland, & Atterbury, 1995). There are also a wide variety of child health problems related to perinatal anxiety, including cognitive, physiological, emotional, and behavioral problems (Brouwers, van Baar, & Pop, 2001b; Field, 2017; O'Connor, Heron, Golding, Beveridge, & Glover, 2002; T. G. O'Connor et al., 2005; van Batenburg-Eddes et al., 2009; Weisberg & Paquette, 2002). Specifically, high antenatal anxiety has been associated with attention deficit hyperactivity disorder (ADHD) symptoms in children, as well as impulsivity and self-reported depressive symptoms in adolescents (Van den Bergh & Marcoen, 2004; Van den Bergh et al., 2005; Van den Bergh, Van Calster, Smits, Van Huffel, & Lagae, 2008). Postpartum mothers with anxiety have also been shown to be less sensitive in responsiveness with decreased emotional tone during interactions with their infants (Nicol-Harper, Harvey, & Stein, 2007), as well as having shorter breastfeeding duration (Paul et al., 2013; Stuebe, Grewen, & Meltzer-Brody, 2013). Perinatal anxiety is associated with lower overall maternal confidence in terms of the parent-child relationship (Clout & Brown, 2015; Reck, Noe, Gerstenlauer, & Stehle, 2012), as well as debilitating shame, failure, and feelings of

inadequacy by the mother (Kleiman, 2008; Mollard, 2014). The partner relationship has been found to be imperative as well. For instance, protective factors for perinatal depression and anxiety have been found in partners, specifically emotional closeness and global support (Pilkington, Milne, Cairns, Lewis, & Whelan, 2015). Therefore, perinatal anxiety has a profound effect not only on the mother but also the infant and the entire family system. In addition, it is imperative to look at the effects of perinatal anxiety on diverse populations.

Diverse Populations

Women from racial/ethnic minorities and/or socioeconomic disadvantage may be at higher risk for adverse pregnancy and postpartum related outcomes. For example, Black women are at higher risk for adverse birth outcomes, such as fetal death, low birth weight, and preterm delivery, compared to majority women overall (Buescher & Mittal, 2006; Nabukera et al., 2009). In a sample of diverse antenatal urban women, it was reported that 78% experienced low-to-moderate psychosocial stress and 6% experienced high levels of stress (Woods, Melville & Guo, 2010). Additionally, anxiety rates for African women may be higher during pregnancy compared to non-pregnant populations (Adewuya, Ola, Aloba, & Mapayi, 2006). While less studied in terms of anxiety, one study reported no difference in perinatal depression rates or stress and psychosocial impact between African American and European American women (Ritter, Hobfoll, Lavin, Cameron & Hulsizer, 2000). However, overall, those women with lower income, as indicated by being on Medicaid, are more likely to have perinatal depressive symptoms (Lancaster et al., 2010). Protective factors may vary as well, for instance, among Latina women, stronger familialism is negatively correlated with perinatal anxiety, but less significantly for white women (Campos et al., 2008). Women from minority groups may also have different preferences for treatment. For instance, Black women seek help for perinatal depression more

frequently overall and may rely on religious leaders for treatment of mental health (O'Mahen & Flynn, 2008). These women also reported less confidence in advice provided by family and friends surrounding perinatal depression, as well as less confidence in using antidepressants (O'Mahen & Flynn, 2008). Receipt of treatment may differ as well. In one study on universal perinatal depression screening of 97,678 women, provider follow-up rates for Black women and women on Medicaid were significantly lower (Avalos et al., 2016).

Measuring Perinatal Anxiety

Screening for perinatal anxiety most often occurs in internal medicine, family practice, obstetrical, and pediatric settings, as well as in mental health agencies and through other nurses and midwives who may have contact with mothers (Hickie et al., 2001; Milgrom & Gemmill, 2015; Olin et al., 2016). Screening for mental health during the perinatal period includes a single screening measure to assess symptoms within a recent duration, such as the prior two weeks. While recommendations from the American College of Obstetricians and Gynecologists (ACOG) may include the word “anxiety” in terms of screening, it does not recommend an anxiety specific measure; therefore, clinicians may only be detecting depressive symptoms and illnesses (ACOG, 2015; Kurtz, Levine, & Safyer, 2017).

In a systematic review of perinatal anxiety screening measures, the General Health Questionnaire (GHQ; Goldberg, 1978), State Trait Anxiety Inventory (STAI; Spielberger et al., 1970) and Hospital Anxiety and Depression Scales (HADS; Zigmond & Snaith, 1983) were the most commonly validated self-report measures (Meades & Ayers, 2011). Meades and Ayers' (2011) review did not examine the Generalized Anxiety Disorder Scale 7 (GAD-7), which is recommended by the National Institute for Healthcare and Excellence (NICE; 2014) clinical guidelines for perinatal anxiety. In the following review, I will describe specific anxiety

screening measures, as well as their critiques. Specifically, the Edinburgh Postnatal Depression anxiety subscale (EPDS-3A) and the GAD-7 will be examined in depth.

Edinburgh Postnatal Depression Scale and Anxiety Subscale

The Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987) is a reliable and valid 10-item measure for screening perinatal women in healthcare settings for depression, and is used extensively (Cox et al., 1987; Eberhard-Gran, Eskild, Tambs, Opjordsmoen, & Ove Samuelsen, 2001). In fact, one research team found that 95% of practices use the EPDS for screening depression during the postpartum period (Alder et al., 2008). Although originally not intended to measure anxiety (Cox & Holden, 2003), using a two-factor structure from the total EPDS measure, the EPDS has three questions as a subscale, called the “EPDS-3A” (items 3, 4, and 5) that assess anxiety (Matthey, 2008; Matthey et al., 2013). These items are, “I have blamed myself unnecessarily when things went wrong,” “I have been anxious or worried for no good reason,” and “I have felt scared or panicky for no very good reason.” A cut-off score of 6 or greater for anxiety has been found with a range of 0-9 (Matthey, 2008). Chronbach’s α for the anxiety subscale has been cited as 0.60 (Brouwers, van Baar, & Pop, 2001a) and 0.74 (Swalm et al., 2010). Validity has not been reported for the measure; however, factor loadings of the three-item subscale have been reported as $> .070$ (Swalm et al., 2010), sharing 12.3% of the total scale’s variance (Matthey, 2008). For the detection of generalized anxiety disorder (GAD) diagnoses, the EPDS-3A has been found to have sensitivity (percentage of diagnosed cases scoring above the cutoff score) of 88% and specificity (percentage of diagnosed non-cases scoring below cut-off score) of 49% (Grigoriadis et al., 2011) indicating that the measure can adequately detect GAD.

A plausible case has been made that the EPDS-3A can reliably distinguish anxiety from depression in populations of perinatal women (Jomeen & Martin, 2005; Matthey, 2008; Matthey et al., 2013; Phillips et al., 2009; Swalm et al., 2010). In other studies, the full EPDS scale has been found to screen just as well for anxiety as the EPDS-3A and may therefore not adequately distinguish depression from anxiety (Grigoriadis et al., 2011; Matthey et al., 2013; Muzik et al., 2000; Rowe et al., 2008). Nonetheless, women with anxiety disorders scored significantly lower on the overall EPDS than women with major depressive disorder (MDD) by an average of five points, making these women likely to be overlooked during routine depression screenings (Muzik et al., 2000).

In a population of mothers in neonatal intensive care unit, EPDS-3A was used and discovered that one quarter of those detected for elevated anxiety symptoms would have been missed during routine depression screening (Stasik-O'Brien et al., 2017). In a recent study, midwives in nine diverse birth centers used the EPDS-3A in a program for screening and management of perinatal anxiety for 387 participants (Toler, Stapleton, Kertsburg, Callahan, & Hastings-Tolsma, 2018). Results indicated that the measure is feasible and detected 6.5% more women than routine depression screening (Toler et al., 2018). On the other hand, evidence also exists that the depression subscale more highly correlates with other measures of anxiety than the anxiety subscale, indicating suboptimal validity (Brouwers et al., 2001a).

EPDS and diverse populations. One study used the full EDPS to assess depression in African American perinatal women from low-income urban communities and found the EPDS had a high accuracy rate of 0.96 for detecting major depression (Tandon, Cluxton-Keller, Leis, Le, & Perry, 2012). However, it should be noted that lower cut-off scores improved sensitivity of the measure, meaning that the typical higher cut-off scores on the measure may miss populations

of Black women (Tandon et al., 2012). The EPDS has also been translated to Spanish and culturally adapted for use with Latino populations (Wojcicki & Geissler, 2013). Additionally, the full depression measure has been validated with low-income populations (Boyd, Le, & Somberg, 2005). The anxiety subscale, the EPDS-3A has not been examined within specific minority populations of women. Therefore, some caution is warranted when applying the suggested anxiety subscale until more research has examined its application to diverse populations of women.

Overall, the full EPDS measure for depression is widely used in routine depression screenings in healthcare settings during the perinatal period. However, even though the full measure is routinely used, it is unlikely that physicians are using the EPDS-3A subscale for the purpose of screening for anxiety. Therefore, this makes it highly plausible that healthcare settings are missing perinatal anxiety altogether if they are not using another anxiety-specific measure.

Generalized Anxiety Disorder Scale

While the EPDS-3A may improve the likelihood of detecting anxiety, its mixed results make it less than ideal for screening perinatal anxiety (Muzik et al., 2000; Rowe et al., 2008; Stasik-O'Brien et al., 2017). Both NICE guidelines and ACOG recommend using a two-item validated tool for perinatal anxiety and depression, such as the GAD-2, with a more in-depth instrument, such as the GAD-7, for those with positive results, which is a 3 or above on the initial two question screener (ACOG, 2015; NICE, 2014). The GAD-2 includes the following questions: “During the past month, have you been feeling nervous, anxious or on edge?” and “During the past month have you not been able to stop or control worrying?” If results of the screener indicate a score of three or above, providers should use the full GAD-7 measure for

further screening (NICE, 2014). This includes more questions related to anxiety, such as how often the individual has been bothered by “trouble relaxing,” “being so restless that it’s difficult to sit still,” “becoming easily annoyed or irritable,” and finally, “feeling afraid as if something awful might happen.” (Spitzer et al., 2006).

Overall, the GAD-7 is a self-report measure of anxiety used to assess for generalized anxiety disorder (GAD) in primary care populations (Spitzer et al., 2006). GAD-7 scores have a range of 0 to 21, with cut-off scores to indicate mild (≥ 5), moderate (≥ 10) and severe (≥ 15) anxiety levels (Spitzer et al., 2006). Through validation of the measure, a cut-off score of 10 yielded a sensitivity of 89% and specificity of 82% for predicting diagnoses of GAD in a sample of primary care patients (Spitzer et al., 2006). Further, prior studies reported an internal consistency of $\alpha = 0.89$ (Löwe et al., 2008) and $\alpha = 0.92$ (Spitzer et al., 2006). Test-retest reliability has been reported at 0.83 (Spitzer et al., 2006) with intercorrelations between items ranging from $r = 0.45$ to $r = 0.65$ (Löwe et al., 2008). In populations of perinatal women, the GAD-7 has been studied, with sensitivity of 61.3% and specificity of 72.7% for predicting a diagnosis of GAD; however this was with a different cut-off score for the measure of 13 rather than 10 (O'Hara et al., 2012; Simpson et al., 2014).

GAD-7 and diverse populations. In terms of diverse populations, the GAD-7 has been studied within the context of many cultural minorities. The Spanish version of the measure has been validated in Latino populations of perinatal women (García-Campayo et al., 2010; Zhong et al., 2015). This measure has also been applied to populations of anxious African American adolescents (Ginsburg & Drake, 2002), as well as Black and Latina breastfeeding women in the early postpartum period (Howell et al., 2014). The GAD-7 has also been used to study antepartum anxiety in sub-Saharan African women (Bindt et al., 2012). Further, biases of the

GAD-7 have been uncovered in a study on Black, Hispanic, and white undergraduate students (Parkerson, Thibodeau, Brandt, Zvolensky, & Asmundson, 2015). Researchers found Black participants scored lower overall on the GAD-7 (Parkerson et al., 2015). This may indicate that Black women with anxiety may be overlooked because they score below the cut-off for anxiety when screened during routine healthcare visits.

Findings indicate the GAD-7 outperforms the EDPS and the EPDS-3A subscale for perinatal women in terms of specificity and accuracy at identifying generalized anxiety disorders (Simpson et al., 2014). In a study of 240 perinatal women, clinical diagnoses of GAD were compared to both the EPDS-3A and GAD-7 (Simpson et al., 2014). Compared to both the overall EPDS and EPDS-3A subscale, the GAD-7 had both greater accuracy and specificity and more accurately identified patients with GAD (Simpson et al., 2014). Further, research reveals that a two-item screener followed by a second, expanded instrument for those who have a positive result may be the best approach to reduce false positives and false negatives (Milgrom & Gemmill, 2014; Myers et al., 2013). In addition, the brevity of the tool makes it simple and quick for healthcare providers to administer and assess, much like the popular use of the Patient Health Questionnaire, PHQ-2 and PHQ-9, for routine depression screenings in healthcare clinics (Kroenke et al., 2001; NICE, 2014).

State Trait Anxiety Inventory

In terms of research on anxiety overall, the State Trait Anxiety Inventory (STAI) (Spielberger et al., 1970) is the most commonly used measure and has been widely validated in perinatal populations (Dennis, Coghlan, & Vigod, 2013; Glasheen, Richardson, & Fabio, 2010; Meades & Ayers, 2011). The measure has 40 questions, half are related to how the respondent feels in the moment (state) and half are about general or enduring anxiety (trait). Content and

criterion validity have been demonstrated (Julian, 2011; Meades & Ayers, 2011; Okun, Stein, Bauman, & Silver, 1996), with test-retest reliability ranging between .37 and .85 (Hundley, Gurney, Graham, & Rennie, 1998; Spielberger et al., 1970; Tendais, Costa, Conde, & Figueiredo, 2014) and strong internal consistency of .91 to .95 (Grant, McMahon, & Austin, 2008; Tendais et al., 2014). In one study, sensitivity of 65.7% and specificity of 67.3% for screening anxiety cases in pregnancy has been found; with sensitivity of 71.4% and specificity 67.1% for postpartum population (Tendais et al., 2014).

Evidence on the STAI indicates that its use during the perinatal period may be confounded by some of the questions such as “I tire quickly,” “I feel comfortable,” and “I feel relaxed” that are typical pregnancy and postpartum related features, potentially increasing rates of false positives (Ayers et al., 2015). Further, the STAI has been primarily used to study perinatal anxiety in terms of its determinants and outcomes (Grant et al., 2008; Meades & Ayers, 2011), though researchers have seldom used the measure in the context of routine primary healthcare physician screenings (Tendais et al., 2014). For instance, in one study the STAI was used to assess perinatal anxiety and associated outcomes such as premature and low birth weight (Bhagwanani, Seagraves, Dierker, & Lax, 1997). The focus on determinants and outcomes may be because of the measure’s lengthy nature, making it unfeasible for routine screening in healthcare settings.

STAI and diverse populations. In terms of diverse contexts, the STAI has been studied in a variety of underrepresented minority populations. For instance, in one study the STAI was used to examine anxiety within minority and low-income women with HIV (Catz, Gore-Felton, & McClure, 2002). Results indicate these women’s distress was elevated compared to other studies on general populations. It has also been examined in populations of minority

breastfeeding women (Pugh, 2001). Further, the STAI has been used to examine factors influencing anxiety in Black sexual minority men (Graham, Aronson, Nichols, Stephens, & Rhodes, 2011) and LGBT individuals in general (Iniewicz & Wrona, 2014).

Perinatal Anxiety Screening Scale

A new measure called the Perinatal Anxiety Screening Scale (PASS) (Somerville et al., 2014) was recently developed. The scale is lengthy, including 31 items with a four factor structure, measuring acute anxiety, general worry, specific fears, perfectionism, trauma, and social anxiety. Test-retest reliability for the measure was 0.74, with good internal construct validity between factor structures, and Chronbach's α for the measure = 0.96 (Somerville et al., 2014). Preliminary results indicate that the PASS does a better job detecting anxiety disorders in comparison to the EPDS-3A (Somerville et al., 2014). However, authors of this scale do not mention the GAD-7 at all in comparison or critique of this measure; rather, they critique other measures of perinatal anxiety such as the STAI and Edinburgh (Somerville et al., 2015). This measure has been applied to Latino immigrants in one study, though its application to other diverse populations is still needed (Hernandez, 2017). Further development and testing of this scale is necessary prior to implementing it for universal screening.

Screening for Anxiety in a Medical Setting

Cases have been made for routine global screening, particularly for PPD, which has been implemented in the U.S. and around the world (Austin, Middleton, Reilly, & Highet, 2013; Rhodes & Segre, 2013). Mental health screening in routine healthcare visits is linked to increased follow-up care, such as referrals, medication management, and brief interventions (Milgrom & Gemmill, 2015). In turn, these interventions lead to increased likelihood of decreased symptomatology.

While depression has been extensively studied in perinatal screening contexts, anxiety has been seemingly overlooked in the literature, policies, and some clinical guidelines. The American College of Obstetricians and Gynecologists (ACOG) recommends psychosocial risk factor screening of pregnant women at least once during the perinatal period for depression and anxiety (ACOG, 2015). Though the term anxiety is mentioned, no specific measure for anxiety screening is recommended. In a committee for underserved women, ACOG recommended psychosocial screening, including depression, of pregnant women at least once per trimester (or 3 times during prenatal care) (ACOG, 2006). Further, in the most comprehensive, evidence-based perinatal anxiety screening guidelines, NICE (2014) recommends healthcare providers screen at the first primary care visit and early during the postnatal period. The American Academy of Pediatrics recommends PPD screening at every well-child visit; however, they neglect to mention screening for anxiety (Bright Futures & American Academy of Pediatrics, 2012; Sriraman, 2012). These mixed findings make it unclear as to how often screening should occur during the prenatal period (Milgrom & Gemmill, 2015). However, screening earlier in pregnancy is preferable in order to reduce the impact of anxiety on the developing fetus (Ayers et al., 2015).

Value and Barriers of Screening

Most extensively studied in the context of perinatal depression, findings on pre-and postnatal mental health reveal a need for clinicians to screen, educate, and facilitate referrals in routine healthcare visits (Coates et al., 2015; Feeley, Bell, Hayton, Zelkowitz, & Carrier, 2016). Women also report the importance of their experiences with the healthcare system because of the new and stressful demands of motherhood (Coates, Ayers, & de Visser, 2014). However, limited time, skills, lack of resources, and training are barriers that can prevent conversations about

mental health from occurring during visits (Byatt, Biebel, et al., 2012; LaRocco-Cockburn, Melville, Bell, & Katon, 2003). Adversely, women who are not asked about their emotional health at all are less likely to seek help during the perinatal period (Reilly et al., 2014). In fact, according to one study, women not assessed during the antenatal period were 93% less likely to seek help than women who were screened and referred to mental health services (Reilly et al., 2014). Additionally, healthcare providers may overestimate their own screening rates, with one study reporting that 95% of obstetric providers overestimate their depression screening rates (Kim et al., 2009). However, in a study about perinatal depression, 93% of women felt it was desirable to ask about perinatal mental wellbeing and 97% felt comfortable answering questions about it (Mann, Adamson, & Gilbody, 2015). While unexplored in the anxiety population, studies on perinatal depression discovered the greatest barriers for women receiving treatment were lack of time and stigma (Goodman, 2009; Ko et al., 2012). In terms of future directions, most women indicated a preference to receive mental health care at the obstetrics clinic, either from their obstetrics practitioner or from a mental health practitioner located at the clinic (Goodman, 2009; Ko et al., 2012).

Anxiety detection in the perinatal period is not only missing in the literature, screening and follow up during routine medical visits may be missed altogether (Ford et al., 2017; Ford et al., 2016). Screening recommendations are often limited to depressive symptoms, even if they mention that screening for anxiety “should” happen (O'Connor et al., 2002; O'Connor, Rossom, Henninger, Groom, & Burda, 2016). While more focused on literature and recommendations for providers, even depression may not be adequately addressed. In the U.S. alone, under half of perinatal women are being appropriately screened for depression (O'Hara, 2009; Seehusen, Baldwin, Runkle, & Clark, 2005), even when clinics have active perinatal depression screening

programs (Kim et al., 2009; Olin et al., 2016). While screening for anxiety may be recommended, there are no clear guidelines provided about recognition and steps for follow-up (Kendig et al., 2017). Further, there is not evidence to suggest that anxiety screening is actually being implemented at the clinical level (Palladino et al., 2011; Stasik-O'Brien et al., 2017). However, in studies of home visits for PPD, health visitors reported that they need more training for anxiety, since screening and follow-up were more directed toward depression and perinatal anxiety was the main condition for which they actually provide support (Ashford, Ayers, & Olander, 2017; Orengo-Aguayo & Segre, 2016). Thus, evidence-based clinical guidelines for anxiety screening are imperative (Yawn, Bertram, Kurland, & Wollan, 2015).

Anxiety and Depression Screening Evidence

Studies on screening for perinatal anxiety have focused on detection of anxiety. In one study on postpartum anxiety and depression, a total of 17% of 1,123 participating mothers screened positive for anxiety (Paul et al., 2013). Further, positive scores for anxiety occurred more frequently than depression scores across two weeks to six months postpartum (Paul et al., 2013). In another postpartum screening study, 13% of participants were identified as having anxiety alone or in combination with depression (Miller et al., 2006). However, anxiety screening can often be overlooked during the perinatal period. In a population of mothers in neonatal intensive care units, the EPDS-3A was used and revealed that one quarter of those detected for elevated anxiety symptoms would have been missed during routine depression screening (Stasik-O'Brien et al., 2017). In one study on perinatal populations, it was found that training staff significantly increased confidence in their ability to identify and manage psychological distress, such as anxiety (King, Pestell, Farrar, North, & Brunt, 2012). In a recent qualitative review of management of perinatal depression and anxiety by general practitioners,

results revealed a focus on depression, highlighting large gaps in the perinatal anxiety literature (Ford et al., 2017). In a separate quantitative systematic review of management of depression and anxiety by general practitioners, all 13 studies reviewed focused on depression, while only two focused on anxiety disorders (Ford et al., 2016). Further, these two studies did not separate anxiety from depression, which is a common error among screening literature (Ford et al., 2016).

Because anxiety screening is scant in the literature, we must turn to research on perinatal depression screening to understand the future direction for perinatal anxiety screening. In one study of 3,472 pregnant women in ten obstetric clinics, screenings indicated that 20% of women screened positive for depression (Marcus, Flynn, Blow, & Barry, 2003). In another study, 80% of pregnant women in a high-risk sample were not receiving any form of depression treatment and among those with a major depressive disorder (MDD), only 33% were currently receiving treatment (Flynn, Blow, & Marcus, 2006). Research has revealed that universal screening programs (i.e., screening every patient in the clinic) for depression may significantly increase diagnoses of depression. For instance, in one population retrospective cohort study of 97,678 women, a universal perinatal depression screening program was implemented in stages from pre-implementation to rollout to full implementation (Avalos et al., 2016). When patients scored above the cutoff for depression, further discussions of depression as well as classes, support groups, individual counseling, or medications were given (Flanagan & Avalos, 2016). Results indicate that 1% of women were screened for depression during pre-implementation to 98% during the full implementation phase. Improvements in depressive symptoms were also seen up to six months postpartum (Avalos et al., 2016). Of those who screened for depression, Black women and women on Medicaid were less likely to receive follow-up from providers (Avalos et

al., 2016). This indicates a need to examine screening and follow-up processes for these minority populations (Avalos et al., 2016).

In other reviews and RCTs of PPD screening and management programs, results differed across studies, however improvements in screening rates and in some cases, maternal outcomes, such as increased rates of PPD diagnoses and decreased depressive symptoms were found (Leung et al., 2010; Miller et al., 2009; Myers et al., 2013; O'Hara, 2009; Olin et al., 2016; Yawn, Dietrich, et al., 2012; Yawn, Olson, et al., 2012). However, in the U.S. alone, under half of perinatal women are being appropriately screened for depression (O'Hara, 2009; Seehusen et al., 2005), even when clinics have active perinatal depression screening programs (Kim et al., 2009; Olin et al., 2016). Further, these programs often focus solely on depression or lump anxiety and depression together without using a specific anxiety screening tool, thereby neglecting critical anxiety screening protocols.

Care Management Following Screening

According to the U.S. Preventative Task Force (2016), screening alone (i.e., without follow-up) for mood disorders such as PPD has not been shown to improve patient outcomes and may be unethical (U.S. Preventative Task Force, 2009; O'Connor et al., 2016; Siu et al., 2016; Yawn, Olson, et al., 2012). Further, potential harm from screening has been cited in terms of causing distress, stigma, diversion of resources, and being misused as a diagnostic tool resulting in unnecessary treatment (Byatt et al., 2013; Milgrom & Gemmill, 2015). Therefore, more must be done to follow-up and ensure ethical care of patients. The U.S. Preventative Task Force define this as care in clinical practices that have “adequate systems in place to ensure accurate diagnosis, effective treatment, and appropriate follow-up” after screening (pp. 380, Siu et al., 2016). In a consensus bundle on perinatal depression and anxiety, it is recommended that every

clinical care setting have mental health screening tools available, establish a protocol for follow-up care, and educate clinicians and staff to use the protocol (Kendig et al., 2017). However, an anxiety-specific screening tool is not specified, rather the Edinburgh Postnatal Depression Scale (EPDS) is simply noted to have “anxiety-relevant questions” (pp. 424, Kendig et al., 2017). In this manner, it is important to approach screening sensitively and with a combined focus on follow-up care informed by best practices. In one review of PPD screening programs, it was found that most programs have a screen and manage approach, including education, medication management, motivational help-seeking, engaging social supports, and outside referrals (Olin et al., 2016). In order to effectively deliver follow-up care, collaborative care is framework used to foster a connection between physical and mental health.

Collaborative Care

Collaborative care is a team-based approach in which mental health professionals, psychiatrists, and physicians provide mental health treatment based on evidence-based guidelines (Katon et al., 1999; Penkunas & Hahn-Smith, 2015; Unützer et al., 2002). The approach was originally designed to treat older couples with depression, but has been expanded to perinatal women and other populations (Unützer et al., 2002). Collaborative care relies on psychiatric consultation of the mental health needs of patients, such as meetings with staff, as well as nurse or physician follow-up and management (Johnson et al., 2014; Katon et al., 2010). Nurses or depression care managers are often trained in mental health needs of patients (McGregor, Lin & Katon, 2011). Collaborative care is a form of integrated care. Integrated care at the highest level typically involves a “shared culture” of on-site mental health management by a trained specialist, such as a social worker or medical family therapist, working in direct communication with physicians to optimize a unified medical and behavioral health treatment plan (Blount, 2003;

Marlowe et al., 2014). Many studies may use the term “collaborative care” or “integrated care” and the distinction is not always apparent. While both models exhibit exemplary evidence of improved outcomes for patients, the current study will implement a new protocol into a clinic context that is guided by the collaborative care model.

While primarily studied in the context of depression, collaborative care approaches have been shown to reduce both depression and anxiety symptoms (Archer et al., 2012; van't Veer-Tazelaar et al., 2009). Rates of referral and treatment for women with positive screening results of PPD are significantly higher when screening, diagnosis, and treatment are provided in the same setting, such as collaborative care settings (Myers et al., 2013). Only a few studies have evaluated collaborative care for perinatal depression (Grote et al., 2014; Grote et al., 2015; LaRocco-Cockburn et al., 2013), and no known studies have evaluated collaborative care for perinatal anxiety. Nevertheless, over 70 RCTs have shown collaborative care to be an effective approach, and several have indicated positive outcomes for perinatal depression (Archer et al., 2012; Grote et al., 2014; LaRocco-Cockburn et al., 2013), thus offering a rationale for using the approach.

Stepped care. Stepped care is a framework that is often used in collaborative care settings (NICE, 2014). It is recommended in evidence based guidelines and provides a method for managing follow up care (NICE, 2014). The stepped care approach is a tool to help patients receive the most effective, yet least resource intensive care based on their individual level of risk—“stepping up” care to more intensive interventions as required (Grote et al., 2014; Katon et al., 1999; Unützer et al., 2002). Following screening and diagnosis, the stepped care approach informs decisions about follow-up care. The least intensive approach that seems suited for a given patient is offered and patients are monitored to determine if the intensity of the treatment

needs to be increased (Gjerdingen, Crow, McGovern, Miner, & Center, 2009). Stepped care is recommended by NICE guidelines (2014) for the treatment of perinatal anxiety and depression in the healthcare setting. The context in which the study will be conducted uses a stepped collaborative care model.

According to NICE guidelines (2011) for Generalized Anxiety Disorder (GAD) and other anxiety-related disorders, stepped care is a recommended framework for routine healthcare screenings. Step 1 is for all suspected presentations of GAD, which includes assessment support, psycho-education, and monitoring (NICE, 2011). Step 2 is for those diagnosed with GAD that have not improved after education and monitoring. This includes low-intensity psychological interventions, non-facilitated self-help, guided self-help, and psychoeducational groups. Step 3 is for those who are not responding adequately to Step 2, with treatment being high-intensity psychological intervention or drug treatment. Finally, Step 4 is for those complex cases with functional impairment or risk of self-harm. This includes a highly specialized treatment such as complex drug and psychological treatments, crisis services, and inpatient care (NICE, 2011).

While unstudied in populations with perinatal anxiety, there have been stepped care programs for PPD and overall perinatal mental health. In a stepped care collaborative care program, the intervention consisted of initial primary care consultation, telephone follow-up with a care manager, patient education, decision support for primary care providers, and consultation and referral to mental health specialist for severe cases (Gjerdingen et al., 2009). Results indicated that women diagnosed with depression had an increased awareness of their depression diagnosis and their receipt of treatment (Gjerdingen et al., 2009). In a similar stepped care intervention study for PPD, results indicated elevated screening scores, with those in the intervention being more likely to receive a diagnosis and therapy, as well as lower depressive

symptoms (Yawn, Dietrich, et al., 2012). Further, in a recent study, Olin and colleagues (2017) propose a stepped care model for postpartum depression (PPD) in the pediatric setting. This includes a process of screening, systematic risk assessment who screen positive, and care management based on risk profiles (2017). As part of a stepped care perinatal mental health program in South Africa, 90% of women were offered mental health screening and 32% qualified for counseling referral (Honikman, Van Heyningen, Field, Baron, & Tomlinson, 2012). Of those 32%, 62% agreed to counseling sessions and 77% attended their appointments (Honikman et al., 2012). Overall, 87.8% of women reported improvements in their presenting problems (Honikman et al., 2012).

NICE stepped care guidelines for perinatal anxiety. NICE guidelines outline a specific stepped care protocol for the screening and management of perinatal anxiety. Screening at first visit and monitoring for symptoms particularly within the first few weeks after childbirth is recommended (NICE, 2014). The GAD-2 screener and GAD-7 for further screening is the suggested protocol. For women with persistent subthreshold symptoms of anxiety, low intensity interventions are suggested, such as facilitated self-help. For women with suspected anxiety disorders, both low or high intensity interventions are recommended, depending on severity of mental health problem suspected (see Table 1 and Figure 1). High intensity interventions are defined as psychological interventions by a qualified mental health practitioner (NICE, 2014).

Low intensity interventions. In stepped care, following screening, the next step consists of management and follow-up for those with mild to severe symptoms (Grote et al., 2014; NICE, 2014; Yawn, Dietrich, et al., 2012). NICE guidelines and other stepped care programs for perinatal mental health recommend follow-up as low-intensity interventions for those above a certain cutoff (see Table 1), such as brief education about anxiety, identifying support networks,

facilitated self-help, and potential follow-up interview with a mental health consultant (Gjerdingen et al., 2009; NICE, 2014; Yawn, et al., 2012). In one literature review of prenatal screening, following an adaptation of the Screening, Brief Intervention, and Referral to Treatment (SBIRT) model, developed by the Substance Abuse and Mental Health Services Administration (2016), appropriate follow-up based on risk is applied to prenatal anxiety (Records & Hanco, 2016). For low-intensity interventions, for those who score from 10 to 15 on the GAD-7, are provided brief intervention, education, and stress management (Records & Hanco, 2016). Overall, because of large gaps in the literature on perinatal anxiety, additional research on screening and follow-up are needed (Ashford et al., 2017; Ford et al., 2017; Ford et al., 2016).

High intensity interventions. Psychological interventions for perinatal anxiety are offered, typically by outside referrals, to perinatal women who are at high risk after screening and management protocols have been followed. These interventions vary and often include home visits, cognitive behavioral therapy (CBT), interpersonal psychotherapy (IPT), web-based programs, and group therapy modalities as well as other techniques such as mindfulness and exercise programs (Danaher et al., 2013; Dimidjian et al., 2015; Kingston et al., 2015; Ko, Yang, Fang, Lee, & Lin, 2013; Loughnan et al., 2018; Marchesi et al., 2016; Rahman et al., 2013; Taylor, Cavanagh, & Strauss, 2016; Wadephul, Jones, & Jomeen; Zlotnick, Tzilos, Miller, Seifer, & Stout, 2016). Additionally, couples therapy has been shown to be an effective psychological intervention for specific mood disorders, such as depression (i.e., Denton, Wittenborn & Golden, 2012), and there is some evidence for its efficacy in treating anxiety as well. NICE guidelines recommend these treatments, such as CBT or IPT, for high-intensity services in the stepped care approach (primarily weekly, face-to-face sessions with a trained

therapist); however, this should not be the direct line or approach to treatment (Clark, 2011). Progress should be monitored with high-intensity interventions, such as referrals for CBT, offered for those with severe symptoms or those who do not improve over the duration of a two-week period (NICE, 2014). It should be noted that for the case of post-traumatic stress disorder, only high-intensity psychological interventions are recommended, as well as the initial treatment of social anxiety disorder (NICE, 2014).

Medication management. Medication management, such as prescription for selective serotonin-reuptake inhibitors (SSRI's), is another line of treatment in the stepped care approach, particularly for those with a anxiety disorder (NICE, 2014). It is important to note that benefits and risks of taking prescription medication during the perinatal period is still not fully understood and potential complications should be addressed with patients (NICE, 2014). While some studies reveal this is a safe and effective line of treatment for perinatal women (Gentile, 2005; Oystein Berle & Spigset, 2011; Werner, Miller, Osborne, Kuzava, & Monk, 2015), other studies have implicated the complications of gestational antidepressant use, such as higher risk for autism, birth defects, and increased risk for ADHD (Bellissima, Ververs, Ha Visser, & Gazzolo, 2012; Clements et al., 2015; Hanley & Oberlander, 2014; Louik, Lin, Werler, Hernández-Díaz, & Mitchell, 2007; Man et al., 2015). Finally, caution should be taken as practitioners may be reliant on prescribing medication as the first line of treatment for perinatal mood disorders rather than using more collaborative approaches (Ford et al., 2016; Khan, 2015).

Implementation Framework

Evaluation of the implementation of an intervention is a vital component to testing changes to practice in real-world settings. This evaluation seeks to answer the question of *how* interventions are translated from a practical standpoint (Polaha & Nolan, 2014). The RE-AIM

evaluation framework, developed by Glasgow and colleagues (1999), is a highly researched implementation model that uses strategies surrounding the reach, effectiveness, adoption, implementation, and maintenance of programs, particularly in public health settings. Reach refers to the proportion of people who are willing to engage in a new initiative in a given health setting, and studies assessing reach may assess recruitment rates, dropout rates, and representativeness of the population (1999). Efficacy or effectiveness encompasses the measured positive and unintended negative outcomes of a study (1999). Adoption refers to a study designed to examine the representativeness of the setting in which the program is implemented (1999). Further, for the implementation domain, delivery of the intervention is focused on, specifically how it is carried out by those not a part of the research team (1999). Finally, maintenance is intended to examine the outcomes over time after the study has concluded, including recidivism and engaging the community in order to enhance sustainability (1999).

A paucity of research using the RE-AIM framework have examined programs such as dementia (Samia, Aboueissa, Halloran, & Hepburn, 2014), PTSD (Zatzick, Koepsell, & Rivara, 2009), physical activity promotion (Estabrooks, Glasgow, & Dzewaltowski, 2003), management of chronic disease (Bodenheimer, Lorig, Holman, & Grumbach, 2002; Glasgow, McKay, Piette, & Reynolds, 2001), and the general improvement of family medicine (Glasgow, 2006). In one study examining a stepped, collaborative care model for PTSD, the “reach” component of the RE-AIM framework was examined by assessing the number, proportion, and representativeness of participants in their program (Zatzick et al., 2009). In another study of collaborative care for depression and diabetes management, the implementation strategy was measured through fidelity checks and interviewing staff delivering the intervention (Wozniak et al., 2015b). In a study examining integration of mental health into the Department of Veterans Affairs, collaborative

care models were used and all dimensions of the RE-AIM framework were assessed (Kirchner et al., 2014). As these studies exemplify, the implementation framework, RE-AIM, has been highly studied in the context of mental health and collaborative care in primary healthcare settings, and is a useful tool to guide the current research.

Conclusion

An overwhelming gap in terms of screening and care management for perinatal anxiety exists in the current literature. That is, perinatal anxiety has been overlooked with an almost sole focus on depression. Yet, it is important to focus on screening and management of perinatal anxiety as it may prevent adverse outcomes for mothers and developing infants. Women from diverse backgrounds, such as racial/ethnic minority and low socioeconomic status are at higher risk for perinatal anxiety. Screening tools, such as the EPDS-3A and GAD-2 and GAD-7 have been studied within the context of perinatal anxiety with success. Collaborative care is a framework for integrating mental health care into primary care settings and has been extensively studied in the context of depression. Evidence-based guidelines for screening and management of anxiety during the perinatal period suggest using a stepped, collaborative care framework during routine healthcare visits (NICE, 2014). This includes stepping-up care based on the severity of anxiety, starting with the lowest level of care based on a given patient's history and working toward more intense services, which is economically advantageous in terms of resource allocation and avoids unnecessary side effects. The RE-AIM implementation framework will guide the integration of a new screening protocol in this study such that the adoption and effectiveness of the approach can be assessed.

CHAPTER III: METHODOLOGY

Research Design

In the current study, I have developed, implemented, and evaluated a perinatal anxiety screening protocol in routine healthcare visits within a stepped, collaborative care setting. The study took place in three family medicine clinics that did not have a perinatal anxiety screening protocol in place, rather routine depression screenings were provided via the EPDS. A screening and care management protocol for anxiety was developed and implemented among perinatal women in the three family medicine clinics. The family medicine residents received training in the GAD-2 and GAD-7 (Spitzer et al., 2006) and follow-up care, and an algorithmic reminder was inserted in patients' electronic health records. Perinatal anxiety rates and rates of screening pre- and post-implementation were examined. The ethnicity of patients in relation to receipt of anxiety screening was assessed as well as providers' perceptions of facilitators and barriers of the new protocol.

Recruitment and Sample

Perinatal women. Participants included women of age 18 years or older who were pregnant or within the first six months postpartum. Participants were patients of Sparrow Health System family health clinic, which is part of Michigan State University's (MSU) family medicine residency program. The Sparrow Health System family health clinic agreed to provide access to the de-identified data needed for this study. Electronic health records were de-identified by Sparrow IT staff members to ensure confidentiality of patients, and all study procedures were approved by the MSU and Sparrow IRB separately. Residents working in the three family medicine clinics predominantly see patients who are on Medicaid, therefore indicating possible lower socioeconomic status and at-risk populations. Additionally, the clinics provide services to

patients from racially diverse populations in the greater Lansing, Michigan area. Patients are a unique population of women who have chosen to receive perinatal care in a family healthcare clinic rather than a tradition OB/GYN setting. Inclusion criteria included perinatal women (pregnant or postpartum up to six months) who were 18 and older and were being seen in one of the clinics. A total of 84 patients pre-implementation and 92 patients post-implementation were gathered for purposes of analysis.

Family medicine residents. A total of 13 family medicine residency providers were examined in the current study. The family medicine residents serve perinatal women at three clinics through the Sparrow Health System. Residents vary in background and demographic characteristics. For the qualitative surveys, all on-site family medicine residents were recruited following the training and provided their responses. All family medicine residents were compensated \$10 for completing the open-ended survey in the form of cash or a Starbucks gift card.

Procedures

Implementation of anxiety screening and management protocol. The overarching goal of the study was to implement a new anxiety screening and management protocol, targeting the first steps of stepped care (NICE, 2014). The implementation of a stepped care screening and management protocol included three components: (a) Training family residency program physicians to screen for anxiety during the perinatal period, (b) Physician implementation of the GAD-2 and 7 as a screening questionnaire for anxiety, and (c) Follow-up provided by physicians and/or Behavioral Health Consultants (BHC) on-site for those with a score of 10 or greater on the GAD-7 in the form of education materials, behavioral health consultant follow-up,

medication management, or outside referral (see Figure 1). This protocol is based in literature on best practices for perinatal anxiety (Gjerdingen et al., 2009; NICE, 2014).

Provider training. Training on the new perinatal anxiety screening and care management protocol was provided to family medicine residents who serve at least one of the three family medicine clinics. Training for healthcare providers is known to reduce barriers to screening (Byatt, Simas, Lundquist, Johnson, & Ziedonis, 2012; Flanagan & Avalos, 2016; Gjerdingen et al., 2009; King et al., 2012; Legere et al., 2017). As one study highlighted, training staff significantly increased confidence in providers ability to identify and manage psychological distress, such as anxiety (King et al., 2012).

Training consisted of a one-time 60-minute session with Sparrow family residency physicians (Gjerdingen et al., 2009). The training included education about anxiety during the perinatal period and specific guidelines for screening using the GAD-2 and GAD-7 and follow up care (Gjerdingen et al., 2009; Glavin, Smith, Sørsum, & Ellefsen, 2010; NICE, 2014). A reminder was inserted into the electronic health records software so that providers were prompted to screen for anxiety. Screening for anxiety was supposed to take place at the first prenatal appointment, 24-week prenatal appointment, six-weeks postpartum, and two, four and six months well-child visits.

Educational materials. Materials for step one of the stepped care screening and management of anxiety were developed in the current study since it was the only step in which the clinics didn't have pre-existing materials. This is referred to as a low-intensity intervention in stepped care (Gjerdingen et al., 2009; NICE, 2014). There were no pre-existing educational tools for perinatal anxiety specifically; therefore, evidence-based materials were developed to hand out to patients about anxiety (see Appendix F). Educational materials mirror PPD ones, including an

NIMH brochure for PPD (U.S. Department of Health and Human Services, 2017). These materials were used alone or in conjunction with other forms of follow-up care, such as medication management or outside psychological referral, depending on the severity of symptoms.

RE-AIM framework. RE-AIM is a useful framework to evaluate the real-world effectiveness of interventions and the methods used to implement those interventions. The current study aimed to focus on the effectiveness, reach, and adoption dimensions of RE-AIM. Effectiveness was measured by examining the rates of anxiety screening pre- and post-implementation. For the reach dimension, ethnicity was examined as a predictor of receiving screening. Regarding adoption, family medicine residents' views surrounding the implementation protocol were assessed. The survey consisted of questions regarding their opinions about the perinatal anxiety protocol (see Appendix E). For the surveys, all on-site family medicine residents were provided a link to answer the open ended questions online through Qualtrics following the training. Those who preferred to complete the survey via paper and pencil were provided a hard copy.

Measures

The EPDS was used during the pre-implementation stage to measure depression screening rates in the clinics. The Edinburgh postnatal depression scale (EPDS) was used because it is the gold standard for screening perinatal depression, and is the measure the family health clinic was using to screen perinatal depression (Cox & Holden, 2003; Cox et al., 1987). The GAD-2 and GAD-7 were used post-implementation since it is the gold standard for anxiety screening and is recommended for anxiety screening in the perinatal mental health clinical management guidelines by NICE (2014).

Edinburgh postnatal depression scale (EPDS). The Edinburgh Postnatal Depression Scale (EPDS) is a widely used measure for screening perinatal women in healthcare settings for depression (Cox et al., 1987; Eberhard-Gran et al., 2001). This measure was already being used to screen for depression in the family medicine clinics. It is often deemed the gold standard of depression measures for perinatal populations (Cox et al., 1987). Internal consistency (Cronbach's standardized alpha) for the EPDS has been found to be 0.87 (Cox et al., 1987) and more recently, 0.857 (Matthey, 2008). Split-half reliability of the EPDS has been found to be 0.88 (Cox et al., 1987).

Generalized anxiety disorder scales. The GAD-2 and GAD-7 were used in the perinatal anxiety screening protocol. The GAD-2 and GAD-7 is the gold standard for anxiety screening, and follows the NICE guidelines (NICE, 2014). The GAD-7 has shown greater accuracy and specificity over the EPDS-3A subscale (Simpson et al., 2014). The GAD-7 is a self-report measure of anxiety used to assess for GAD in primary care populations (Spitzer et al., 2006).

The GAD-2 scores range from 0 to 6, with a cut off score of ≥ 3 , which denotes a screening prompt for the full GAD-7 (Kroenke, Spitzer, Williams & Löwe, 2010). GAD-2 includes the following questions: "During the past month, have you been feeling nervous, anxious or on edge?" and "During the past month have you not been able to stop or control worrying?". If results of the screener indicate a score of 3 or above, providers should use the full GAD-7 measure for further screening (NICE, 2014). Area under the curve (AUC) for the GAD-2 (.80 to .91) is similar to GAD-7 in analysis of various anxiety disorders (Kroenke et al., 2010; Kroenke, Spitzer, Williams, Monahan & Löwe, 2007). Reliability using Cronbach's α of 0.82 has been reported (Seo & Park, 2015). Using the cut-off of 3, the GAD-2 has a sensitivity of 86% and specificity of 83% for diagnosis of GAD (Kroenke et al., 2007).

GAD-7 scores have a range of 0 to 21, with a cut-off score of ≥ 10 (Spitzer et al., 2006). Instructions ask participants to indicate how often they've been bothered by problems in the prior two weeks. Items include "feeling nervous, anxious or on edge", "trouble relaxing", and "feeling afraid as if something awful might happen." Through validation of the measure, a cut-off score of ten yielded a sensitivity of 89% and specificity of 82% for predicting diagnoses of GAD in a sample of primary care patients (Spitzer et al., 2006). Further, internal consistency of $\alpha = 0.89$ (Löwe et al., 2008) and $\alpha = 0.92$ (Spitzer et al., 2006) have been reported. Test-retest reliability has been reported at 0.83 (Spitzer et al., 2006) with intercorrelations between items ranging from $r = 0.45$ to $r = 0.65$ (Löwe et al., 2008). In a population of perinatal women, the GAD-7 had sensitivity at 61.3% and specificity of 72.7% for predicting diagnosis of GAD; however this was with a different cut-off score for the measure of 13 rather than 10 which is not commonly used (Simpson et al., 2014).

Qualitative survey. Qualitative methodology using a survey with open-ended questions (See Appendix E) was used in the current study. Thematic content analysis via qualitative methodology using open-ended surveys is an excellent strategy to uncover phenomena that are not well understood, such as the views of physicians surrounding the perinatal anxiety implementation protocol in the current study (Braun & Clarke, 2006). Thematic analysis was used to examine emerging themes from the data (Braun & Clarke, 2006). Thematic analysis allows for the generation of both implicit and explicit findings from themes gathered inductively from the data (Braun & Clarke, 2006). This involves: (1) becoming familiar with the data through data collection and field notes, (2) independent coders generate initial codes independently by defining overarching themes, (3) coders meet and agree upon themes that have emerged from the data, (4) coders follow the recursive process of returning to the data and

coding the interviews into the themes, line-by-line, checking for erroneous or additional themes throughout the process, and (5) code themes that emerge from the data until consensus is reached (Braun & Clarke, 2006). Further, three verification methods were used for the study design (Creswell and Miller, 2000). Triangulation was used as a validation method by utilizing multiple sources (participants), researchers (two coders), and methods (open-ended survey; Creswell and Miller, 2000). Additionally, in order to effectively enact qualitative methodology, the role of the researcher must be acknowledged (Creswell, 2012). This involves reflexivity by examining researchers' backgrounds and potential biases that could skew the data (Creswell, 2012).

Plan of Analysis

The current plan of analysis involves four main components: a) determine the percent of perinatal women who screen positive for anxiety during routine healthcare visits using the GAD-7, b) examine the effectiveness of the implementation of a perinatal anxiety screening protocol in three family medicine clinics, c) determine if race/ethnicity predicts the receipt of anxiety screening, and d) examine the views of providers in three family medicine clinics on perceptions of facilitators and barriers of perinatal anxiety screening. In the following, I will outline each step of analyses based on each research question for the current study.

Research question one. The first set of analyses examined the following research question: What percent of perinatal women screen positive for anxiety during routine healthcare visits using the GAD-7? Data were pulled from the EPIC electronic health record system for the six months following the implementation of the perinatal anxiety screening and management protocol. Those with a score of ten or more on the GAD-7 were determined to have been experiencing anxiety at the time of their health visit (Spitzer et al., 2006). For women who were assessed more than once, only the first GAD-7 score was used. In order to analyze this data, the

number of positive screens (≥ 10) was then divided by the total number of GAD-7 screens to determine the prevalence of anxiety.

Research question two. The second set of analyses determined the research question: What is the effectiveness of the implementation of a perinatal anxiety screening protocol in three family medicine clinics? For the first part of this research questions, changes in rates of screening for perinatal anxiety were examined pre and post-implementation. This included extracted electronic health records for the three clinics served by family medicine residents. Pre-implementation rates were gathered by examining how many patients were screened with the GAD-7 at least once during the six months prior to the perinatal anxiety screening training (July 23rd 2018 –January 23rd 2019). Post-implementation rates were gathered by examining how many patients were screened with the GAD-7 at least once during the six months following the perinatal anxiety screening training (January 24th 2019 to July 17th 2019).

Further analyses examined the rates of depression screening pre-implementation in order to compare changes in rates of screening among providers. This included examining how many patients were screened for depression using the EPDS at least once during the six months prior to implementation (July 23rd 2018 –January 23rd 2019).

Research question three. For the third research question, analyses were used to determine if race/ethnicity predicted receipt of the anxiety screening. However, it was discovered that race categories were not routinely collected by physicians or recorded in the electronic health record database. Therefore, when data was extracted, only patient ethnicity (Latino/Hispanic versus not Latino/Hispanic) was collected, not nominal race categories. In preparation for analysis, ethnicity was therefore categorized into two variables, patient reporting being not Hispanic/Latino (0) or Hispanic/Latino (1). Anxiety screening was categorized into

either occurring for the patient during the six months post-implementation (1) or not occurring for the patient during the six months post-implementation (0). Logistic regression was then used via SPSS computer software (IBM corp., 2017). The dichotomous ethnicity variable was used to predict if screening with the GAD-7 occurred post-implementation.

Research question four. The fourth analyses helped examine the views of providers in three family medicine clinics on their perceptions of facilitators and barriers of perinatal anxiety screening. Qualitative methodology using data from open-ended questions was used to examine the views of providers surrounding perinatal anxiety screening and the newly implemented protocol. The survey questions revealed their opinions about the perinatal anxiety protocol, including the feasibility and potential barriers surrounding screening for perinatal anxiety (see Appendix E). For the interviews, all on-site family medicine residents were recruited following the training of the protocol (n=13). Thematic content analysis was used to examine emerging themes from the data (Braun & Clarke, 2006). This consisted of inductive, open coding to allow themes generated directly from the data to emerge as well as semantic analysis followed by latent thematic coding (Braun & Clarke, 2006). Two independent coders analyzed the entire content of the transcribed surveys, line-by-line. Then, these coders met and agreed upon themes that have emerged from the data. Following this, coders followed the recursive process of going back and coding the interviews into the themes, checking for erroneous or additional themes throughout the process. This was done in order to code themes that emerge from the data until consensus is reached (Braun & Clarke, 2006).

CHAPTER IV: STUDY ONE

Abstract

Perinatal anxiety is associated with adverse birth outcomes and has long-term effects on mothers and children. Negative outcomes may be exacerbated for women of ethnic/racial minority status and/or socioeconomic disadvantage. Routine screenings during healthcare visits for perinatal women often assess for depression; however, research reveals that about a quarter of women who do not meet the cut-off for depression experience anxiety and are being missed by current practices. Additionally, researchers often overlook the race/ethnicity of patients and how this affects receipt of screening. The current study evaluated the implementation of a perinatal anxiety screening and care management protocol, and also assessed whether implementation varied by patient race and ethnicity. The setting of the current study includes three family health clinics served by family medicine residents. A perinatal anxiety screening protocol was implemented, which included a training session and GAD-2 and GAD-7 screening and follow-up protocol. Pre- and post-implementation anxiety screening scores and screening rates were extracted from electronic health records. Ethnicity of participants was examined to determine if it predicted receipt of anxiety screening post-implementation. The percent of perinatal women who screened positive for anxiety after the screening was implemented 21.82%. Pre-implementation rates of screening for anxiety were 0% and post-implementation rates of screening for anxiety were 59.78%. Pre-implementation rates of screening for depression were 40.48%. Logistic regression revealed that ethnicity did not significantly predict receipt of anxiety screening. Implementation of the screening protocol increased rates of perinatal anxiety screening. Limitations to the current study include that only ethnicity, not the race of patients was routinely collected by medical providers and therefore could not be analyzed in terms of

who received anxiety screening. Future research is needed to assess whether the race of patients predicts whether they are screened for mental health conditions such as anxiety.

Introduction

Anxiety disorders during the pre- and post-natal period impact both the mother and developing child in significant ways. Obstetrical complications such as preterm birth and low birth weight outcomes highlight the need to address this important public health concern for women and children (Agius, Xuereb, Carrick-Sen, Sultana, & Rankin, 2016; Ding et al., 2014; Russell, Fawcett, & Mazmanian, 2013). Perinatal anxiety influences the maternal-child bond. Even before birth, maternal anxiety is associated with less fetal gross body movement in sleep and adverse changes in fetal heart rate (Berle et al., 2005; DiPietro, 2010; Groome, Swiber, Bentz, Holland, & Atterbury, 1995). There are also a wide variety of child health problems related to perinatal anxiety, including cognitive, physiological, emotional, and behavioral problems (Brouwers, van Baar, & Pop, 2001; Field, 2017; O'Connor, Heron, Golding, Beveridge, & Glover, 2002; van Batenburg-Eddes et al., 2009; Weisberg & Paquette, 2002).

In a sample of 310 Canadian women, researchers used the Generalized Anxiety Disorder Scale (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006) for anxiety and EPDS for depression followed by diagnostic interviews (Fairbrother et al., 2016). The reported prevalence of perinatal anxiety disorders was 17.4%, while prevalence of depression was 6.5% (Fairbrother et al., 2016). A sample of perinatal women receiving obstetric care at a teaching hospital were screened using the EPDS and portions of the Patient Health Questionnaire (PHQ-9; Kroenke, Spitzer, & Williams, 2001) for anxiety. Analyses indicated that 23% of women screened positive for anxiety or depressive symptoms at obstetric visits during the third trimester of pregnancy and 17% screened positive postpartum (Goodman & Tyler-Viola, 2010). Although research has been

conducted on the prevalence and adverse outcomes of perinatal anxiety, it is important to begin to examine perinatal anxiety screening in healthcare settings. The majority of studies on screening in healthcare settings have focused on postpartum depression, and practices have been successful in increasing follow-up care (Coates, de Visser, & Ayers, 2015). Healthcare screenings for anxiety are often overlooked. As a result, women often go undetected for anxiety disorders during perinatal checkups in healthcare clinics (Ford et al., 2017; Ford et al., 2016).

Women from racial/ethnic minority and/or socioeconomic disadvantage may be at higher risk for adverse pregnancy and postpartum related outcomes. For example, Black women are at higher risk for adverse birth outcomes, such as fetal death, low birth weight, and preterm delivery, compared to majority women overall (Buescher & Mittal, 2006; Nabukera et al., 2009). Access to and utilization of treatment is lower among low income and minority perinatal women as well. In one study on universal perinatal depression screening of 97,678 women in 15 regional medical centers, provider follow-up rates among Black women and women on Medicaid were significantly lower than Caucasian woman and those not on Medicaid (Avalos et al., 2016). Further, research in general on perinatal screening has often been conducted in medical settings with predominantly white, middle-class populations (e.g. Avalos et al., 2016).

Prior research shows that stress, low self-esteem, feeling unsure or unhappy about pregnancy, low self-mastery, and low levels of social support from a partner or family are significantly associated with anxiety during pregnancy (Akiki, Avison, Speechley, & Campbell, 2016; Biaggi, Conroy, Pawlby, & Pariante, 2016; Dennis, Brown, Falah-Hassani, Marini, & Vigod, 2017). Additionally, socioeconomic disadvantage, low educational status, a history of poor mental health, adverse circumstances around pregnancy and birth, as well as poor quality relationships are all risk factors for anxiety disorders during the perinatal period (Leach et al.,

2017; Martini et al., 2015). Further, antenatal anxiety is associated with smoking, daily stressors, and obstetric complications (Macbeth & Luine, 2010). In particular, anxiety during pregnancy can predict whether or not the baby will be preterm and/or low birth weight (Ding et al., 2014; Liou et al., 2016). Women with high-risk pregnancies are also more likely to experience anxiety disorders overall (Fairbrother, Young, Zhang, Janssen, & Antony, 2017). Perinatal anxiety has been associated with increased healthcare utilization (Paul et al., 2013). In 2016, estimated costs of perinatal anxiety per mother in the UK, translated to U.S. dollars, was approximately \$6,171 for health and social care, \$7,855 for productivity losses, and \$15,677 for health-associated quality of life losses (Bauer, Knapp, & Parsonage, 2016). Total lifetime costs of perinatal anxiety per woman are expected to reach \$49,725 (Bauer et al., 2016). These impacts include costs of child emotional, behavioral, and physical problems, since infant and child health is inevitably affected by maternal anxiety (Bauer et al., 2016).

While screening women for depression with a specific tool, the Edinburgh Postnatal Depression Scale (EPDS; Cox, Holden, & Sagovsky, 1987), is recommended by the American College of Obstetricians and Gynecologists (ACOG, 2015) during the perinatal period, no specific screening measure for anxiety is suggested. The EPDS is a 10-item measure for screening depression among perinatal women in healthcare settings such as the OB/GYN and primary care offices (Cox et al., 1987; Eberhard-Gran, Eskild, Tambs, Opjordsmoen, & Ove Samuelsen, 2001). Women with anxiety disorders scored significantly lower on the overall EPDS than women with major depressive disorder (MDD) by an average of five points, making these women likely to be overlooked during routine depression screenings (Muzik et al., 2000).

The Generalized Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006) is a validated and reliable anxiety screening measure commonly used in medical settings such as primary care

physician offices. Both the GAD-2 screener (first two items of the GAD-7) and GAD-7 are recommended by the National Institute for Healthcare and Excellence (NICE; 2014) in specific guidelines for perinatal anxiety screening. In populations of perinatal women, the GAD-7 has been studied, with sensitivity of 61.3% and specificity of 72.7% for predicting a diagnosis of generalized anxiety disorder (O'Hara et al., 2012; Simpson et al., 2014). This measure has also been applied to populations of anxious African American adolescents (Ginsburg & Drake, 2002), as well as Black and Latina breastfeeding women in the early postpartum period (Howell et al., 2014). Researchers found Black participants scored lower overall on the GAD-7 (Parkerson et al., 2015). This may indicate that Black women with anxiety may be overlooked because they score below the cut-off for anxiety when screened during routine health visits.

While screening and follow-up for perinatal anxiety is important, it has been less extensively studied in comparison to depression. Universal screening protocols for perinatal depression in a variety of healthcare settings have been implemented with success (e.g. Avalos et al., 2016). In order to continue to improve healthcare for women and children, screening and follow-up protocols for perinatal anxiety must be implemented as well. In order to translate research to real-world settings an implementation framework is necessary. RE-AIM is an implementation framework designed to look at the Reach, Effectiveness, Adoption, Implementation, and Maintenance components of a program (Glasgow et al., 1999). This ensures that treatment delivery is not only evidence-based but also sustainable in the long-term (Glasgow et al., 1999). The RE-AIM framework was used in the current study to guide the research questions and ensure appropriate delivery of the perinatal anxiety screening protocol. Specifically, the effectiveness domain of RE-AIM refers to the individual patient by examining potential positive and negative consequences of an implemented program (Glasgow et al., 1999).

This includes specific outcomes of participants, which will be uncovered in the current study.

Implementation strategies is another component of the RE-AIM framework which evaluates staff ability to deliver key components of an intervention (Glasgow et al., 1999). The reach component of RE-AIM addresses representativeness of sample to include all members of an identified population, specifically underrepresented groups (Glasgow et al., 1999).

Current Study

In the current study, an anxiety screening and care management protocol was implemented in three family medicine clinics served by family medicine residents. The clinics in the current study operate from a stepped and collaborative care framework and have a perinatal depression screening protocol, which involves using the EPDS to screen for depression during routine healthcare visits, and treat a predominately Medicaid based population. For the implementation phase of the study, family medicine residents were trained to screen using the GAD-2 and, if positive, the GAD-7 and to provide follow-up care using the stepped care protocol for perinatal anxiety (NICE, 2014). In the current study, the effectiveness, implementation, and reach components of RE-AIM were examined. The research questions are as follows:

1. What percent of perinatal women screen positive for anxiety during routine healthcare visits using the GAD-7?
2. What is the effectiveness of the implementation of a perinatal anxiety screening protocol in three family medicine clinics?
 - a. What is the anxiety screening rate pre and post-implementation?
 - b. What is the rate of screening for depression pre-implementation?
3. Among perinatal women who attended health visits in the three months following implementation, does race/ethnicity predict receipt of anxiety screening?

Methods

Procedures

In the current study, a new anxiety screening and care management protocol was implemented in three hospital-affiliated family medicine clinics served by family medicine residents. The perinatal anxiety screening protocol involved putting automatic GAD-2 and GAD-7 screening reminders in patients' electronic health records and training residents to screen and provide appropriate follow up care, as is recommended by NICE guidelines (2014) for perinatal anxiety screening. Prior to this protocol, only the Edinburgh Postnatal Depression Scale (EPDS; Cox et al., 1987) was used for patients during the perinatal period in these clinics. The perinatal anxiety screening training occurred on January 23rd 2019 and consisted of a one time, 60-minute session, including the background on perinatal anxiety and how to effectively screen and follow-up with patients. Both the university and hospital Institutional Review Boards approved this study.

Participants

Participants in the study were the 84 perinatal women pre-implementation and 92 perinatal women post-implementation. These perinatal women were served by family medicine residents at three family medicine clinics affiliated with Sparrow Health System in Ingham County, Michigan. Electronic health records were pulled for six months pre-implementation and six months post-implementation. No compensation was provided to perinatal women since screening was integrated into routine healthcare visits. See table 1 for demographic characteristics of the participating women. Both the university and hospital Institutional Review Boards approved this study

Analyses

For the first research question, electronic health records were extracted for approximately six months post-implementation (January 24th 2019 through July 17th 2019). This included screening scores from the GAD-7. Perinatal women post-implementation were determined to have anxiety if they scored at or above the cut-off on the GAD-7 (i.e., score of 10 or more). The number of positive screens was then divided by the total number of GAD-7 screens to determine the prevalence of anxiety.

For the second research question, anxiety screening rates were determined pre- and post-implementation. This included extracted electronic health records for the three clinics served by family medicine residents. Pre-implementation rates were gathered by examining how many patients were screened with the GAD-7 at least once during the six months prior to the perinatal anxiety screening training (July 23rd 2018 –January 23rd 2019). Post-implementation rates were gathered by examining how many patients were screened with the GAD-7 at least once during the six months following the perinatal anxiety screening training (January 24th 2019 to July 17th 2019).

For the third research question, race categories were not collected by physicians or recorded in the electronic health record database. Unfortunately, when data was extracted, only ethnicity (Latino/Hispanic versus not Latino/Hispanic) was collected, not nominal race categories. Ethnicity was categorized into two variables, patient reporting being not Hispanic/Latino (0) or Latino/Hispanic (1). Anxiety screening was categorized into either occurring for the patient during the six months post-implementation (1) or not occurring for the patient during the six months post-implementation (0). Logistic regression was then used via

SPSS computer software (IBM corp., 2017). The dichotomous ethnicity variable was used to predict if screening with the GAD-7 occurred post-implementation.

Measures

Generalized Anxiety Disorder scale. The GAD-2 and GAD-7 (Spitzer et al., 2006) are self-report measures of anxiety there were used in the perinatal anxiety protocol that the providers were trained to use. The GAD-2 scores range from 0 to 6, with a cut off score of ≥ 3 , which denotes a screening prompt for the full GAD-7 (Kroenke et al., 2010). GAD-2 includes the following questions: “During the past month, have you been feeling nervous, anxious or on edge?” and “During the past month have you not been able to stop or control worrying?” If results of the screener indicate a score of three or above, providers should use the full GAD-7 measure for further screening (NICE, 2014). Area under the curve (AUC) for the GAD-2 (.80 to .91) is similar to GAD-7 in analysis of various anxiety disorders (Kroenke et al., 2010; Kroenke, Spitzer, Williams, Monahan & Löwe, 2007). Reliability using Cronbach’s α of 0.82 has been reported (Seo & Park, 2015). Using the cut-off of three, the GAD-2 has a sensitivity of 86% and specificity of 83% for diagnosis of GAD (Kroenke et al., 2007).

GAD-7 scores have a range of 0 to 21, with cut-off scores of ≥ 10 indicating a positive screen for anxiety (Spitzer et al., 2006). Instructions ask participants to indicate how often they’ve been bothered by problems in the prior two weeks. Items include “feeling nervous, anxious or on edge”, “trouble relaxing”, and “feeling afraid as if something awful might happen.” Through validation of the measure, a cut-off score of ten yielded a sensitivity of 89% and specificity of 82% for predicting diagnoses of GAD in a sample of primary care patients (Spitzer et al., 2006). Further, internal consistency of $\alpha = 0.89$ (Löwe et al., 2008) and $\alpha = 0.92$ (Spitzer et al., 2006) have been reported. Test-retest reliability has been reported at 0.83 (Spitzer

et al., 2006) with intercorrelations between items ranging from $r = 0.45$ to $r = 0.65$ (Löwe et al., 2008). In a population of perinatal women, the GAD-7 had sensitivity at 61.3% and specificity of 72.7% for predicting diagnosis of GAD; however this was with a different cut-off score for the measure of 13 rather than 10 (Simpson et al., 2014).

Edinburgh Postnatal Depression. The Edinburgh Postnatal Depression Scale (EPDS) (Cox, Holden, & Sagovsky, 1987) is a 10-item measure for screening perinatal women in healthcare settings for depression (Cox et al., 1987; Eberhard-Gran, Eskild, Tambs, Opjordsmoen, & Ove Samuelsen, 2001). It is often deemed the gold standard of depression measures for perinatal populations (Cox et al., 1987). Internal consistency (Cronbach's standardized alpha) for the EPDS has been found to be 0.87 (Cox et al., 1987) and more recently, 0.857 (Matthey, 2008). Split-half reliability of the EPDS has been found to be 0.88 (Cox et al., 1987).

Results

Prevalence

The first research question aimed to evaluate the prevalence of perinatal anxiety in the three family medicine clinics during the study period. Results indicated that 12 women, out of 55 who were screened, scored above the cut-off for anxiety according to the GAD-7. This equates to approximately 21.82% of those screened for anxiety during the perinatal period scored above the cut-off for anxiety on the GAD-7 (10 or above) after the screening protocol was implemented.

Effectiveness

For the second research question, referring to the effectiveness component of RE-AIM, there was a surge in the percentage of perinatal women screened for anxiety occurred before and after the screening protocol was implemented. Pre-implementation rates of screening for anxiety

were 0% and post-implementation rates of screening were 59.78% for anxiety using the GAD-7. In order to compare the post-implementation rate to rates of pre-implementation screening for another common mental health disorder in which the clinics already had established screening protocols, pre-implementation perinatal depression screening rates were also assessed. Results indicate that family medicine residents screened 34 patients out of 84 total patients during the six months pre-implementation. This equates to perinatal depression screening rates at around 40.48% in the three family medicine clinics.

Reach

For the third research question, the reach domain of the RE-AIM implementation framework was examined in terms of considering equity in screening. In order to analyze whether race/ethnicity predicted receipt of anxiety screening post-implementation, logistic regression was used. The total number of patients was 92 with 2 cases of missing data not reporting ethnicity, resulting in 90 total cases used for final analyses. The model included the dichotomous ethnicity variable as a predictor of the dichotomous variable of having received or not received screening. Results indicate that race/ethnicity does not significantly predict receipt of anxiety screening, $\beta = .08$, S.E. = .15, $p = .47$.

Discussion

Findings indicate that approximately 21.82% of perinatal women in the clinics met the cut-off for anxiety during a routine anxiety screening protocol in the study period. Additionally, the implementation of the protocol is indicated by the surge of anxiety screening, from 0% pre-implementation to 59.78% post-implementation. This screening rate is also greater than the rate of depression screening prior to implementation (40.48%). Further, predicting anxiety screening

from patient ethnicity was found to be non-significant. These results show initial promise for the implementation of an anxiety screening protocol through a 60-minute training.

The percentage of women who met the cut-off for perinatal anxiety in the current study, 21.82%, is similar to other studies in which the GAD-7 was used and reported as 17.4% (Fairbrother et al., 2016). Further, it is similar to the rates of women who would be missed during traditional depression screening, around 23.3% (Stasik-Obrien et al., 2017). That is, women who would not have screened positive for depression, such as with overall EPDS scores, but would have using an anxiety-specific measure (Stasik-Obrien et al., 2017). However, prior studies were conducted in specialized settings, such as in the Newborn Intensive Care Unit and midwifery clinics (Fairbrother et al., 2016; Stasik-Obrien et al., 2017). The current study offers a unique insight into a setting of three family medicine clinics served by family medicine residents. It is important to note that key differences could be found based on specific samples of perinatal women. Demographic characteristics such as socioeconomic status, such as those on Medicaid, and identified race could influence the rates of anxiety among different settings (Avalos et al., 2016). Further, low educational status, a history of poor mental health, adverse circumstances around pregnancy and birth, as well as poor quality relationships are all risk factors for anxiety disorders during the perinatal period (Leach et al., 2017; Martini et al., 2015). In the current study, these factors were not examined in depth, which could have an impact on the rates of anxiety that were found.

This is the first known study examining a universal perinatal anxiety screening protocol implemented in a real-world setting. In one study of a universal perinatal depression screening program, women who had at least one obstetric visit during pregnancy or postpartum were examined retrospectively during three phases of implementation of the program (Avalos, Raine-

Bennett, Chen, Adams, & Flanagan, 2016; Flanagan & Avalos, 2016). Data were collected from electronic health records and analyses revealed 1% of women were screened for depression at least once during pre-implementation compared to 97.5% after full implementation. While the improvement in the current post-implementation rate was smaller, 0% to 59.78%, it should be noted that pre-implementation depression screening rates were also significantly lower, at 40.48%. More research is needed to improve anxiety screening rates in the context of real-world practice settings. Quality assurance checks, computerized reminders, or other strategies, along with a 60-minute training, may help to increase rates of screening among providers.

The majority of screening studies have focused on perinatal depression, and while screening programs have been implemented, oftentimes variables such as race and ethnicity are not documented. However, research has revealed that factors such as being Black or on Medicaid result in significantly less follow-up by physicians following depression screening (Avalos et al., 2016). In the current study, however, ethnicity was not found to be a significant factor influencing whether anxiety screening occurred. It should be noted that the current population of family medicine residents included a diverse background, while the majority identified as White/Caucasian (61.5%), there were also 15.4% Black/African American, 15.4% Asian, and 7.7% Other. Further 61.5% of the residents were born in the United States, while 38.5% were born outside of the U.S. This could influence the results as it has been found that the majority of healthcare providers studied in these contexts are White, middle-aged males or their demographic characteristics are not reported (Xierali & Nivet, 2018). It is also important to note that the current study's small sample size could influence these results as well as the fact that traditional race categories were not used, rather only ethnic categories of identifying as Hispanic/Latino.

Limitations

A limitation of this study is the lack of categorical race identifiers for patient demographics. This is the nature of the clinics where the data was derived from since they do not ordinarily collect patient race information, only ethnicity in the form of Latino/Hispanic or non-Latino/Hispanic. Future research should assess this information in order to uncover potential racial differences in receipt of screening and follow-up treatment. In addition, collecting information on socioeconomic status is another important factor that could contribute to the receipt of screening and treatment. Another important component to consider is the small sample size of the current study. While family medicine residents may treat less overall perinatal patients than traditional OB/GYNs, this means the six months pre- and post-implementation provided a small sample size. Conclusions should therefore be interpreted with caution.

Future Directions

The majority of universal perinatal mental health screening programs do not report specific factors associated with patients' race/ethnicity or socioeconomic status. Therefore, it is imperative to examine these factors in terms of their association with patient screening and follow up care for perinatal anxiety. Future research should also assess the implementation of the screening protocol among a larger sample size of perinatal women served in various types of medical settings.

Conclusion

The current study offers unique insight into a perinatal anxiety screening protocol in family medicine clinics. While results indicate similar levels of perinatal anxiety, it is in a unique setting served by family medicine residents. Rates of anxiety screening surged following implementation. These perinatal anxiety screening rates were higher than depression screening

rates in the three clinics prior to implementation. Finally, although no significant predictor was found in terms of ethnicity and anxiety screening, caution should be taken due to the small sample size in the current study. Future research should continue to evaluate the implementation of perinatal anxiety screening programs.

CHAPTER V: STUDY TWO

Abstract

While perinatal anxiety occurs at similar or higher rates than depression, perinatal anxiety has received considerably less attention in research and practice (e.g. Fairbrother, Janssen, Antony, Tucker, & Young, 2016). Perinatal anxiety is associated with short- and long-term adverse effects for women and children, making it imperative that women be screened by their healthcare providers for anxiety during pregnancy and the postpartum period. Guided by the RE-AIM implementation framework, the current study assessed 13 medical residents using qualitative methods to determine the adoptability of a new perinatal anxiety screening protocol to be implemented in three family medicine clinics. Qualitative results of the facilitators and barriers of adopting the protocol, including eight themes overall, indicate that medical residents' views of the protocol are positive overall. The findings of this study are limited by the unique setting of the study, which included family medicine clinics that practiced an integrated care model such that physicians, behavioral health specialists, and psychiatrists worked in collaborative teams to treat the physical and mental health needs of pregnant and postpartum women. Future research examining universal anxiety screening protocols in other healthcare settings is needed.

Introduction

Women are at higher risk for mental health problems such as depression and anxiety during their reproductive years, yet pregnant and postpartum women experiencing anxiety often go undiagnosed (Ko et al., 2012; National Institute for Health & Care Excellence, 2014). The reported prevalence of perinatal anxiety disorders is around 17.4% (Fairbrother et al., 2016), and total lifetime costs of perinatal anxiety is estimated at about \$49,725 per women (Bauer, Knapp,

& Parsonage, 2016). These impacts include costs of child emotional, behavioral, and physical problems, since infant and child health is inevitably affected by maternal anxiety (Bauer et al., 2016). Perinatal anxiety affects the developing fetus, and has adverse effects on the child after birth. Child health problems related to perinatal anxiety include cognitive, physiological, emotional, and behavioral problems (Brouwers, van Baar, & Pop, 2001; Field, 2017; van Batenburg-Eddes et al., 2009; Weisberg & Paquette, 2002). Antenatal anxiety is also associated with daily stress and obstetric complications for mothers (Macbeth & Luine, 2010). In a sample of 1,123 postpartum women recruited during hospital discharge, women who screened above the cut-off for anxiety were more likely to have cesarean delivery, less breastfeeding time, and increased maternal healthcare utilization (Paul, Downs, Schaefer, Beiler, & Weisman, 2013).

Most extensively studied within the context of perinatal depression, findings on pre-and postnatal mental health reveal a need for physicians to screen, educate, and facilitate behavioral health referrals during routine health visits (Coates, de Visser, & Ayers, 2015; Feeley, Bell, Hayton, Zerkowitz, & Carrier, 2016). Women who are not asked about their mental and emotional health are less likely to seek help during the perinatal period (Reilly, 2014). In fact, according to one study, women not assessed during the antenatal period were 93% less likely to seek help than women who were screened and referred to mental health services (Reilly et al., 2014). Unfortunately, a number of barriers prevent providers from initiating conversations with patients about their mental health, including limited time, skills, resources, and training (Byatt et al., 2012; Byatt, Simas, Lundquist, Johnson, & Ziedonis, 2012; LaRocco-Cockburn, Melville, Bell, & Katon, 2003).

Healthcare providers appear to overestimate how regularly they screen patients for common mental health problems, with one study reporting that 95% of obstetric providers

overestimate their rates of screening for depression (Kim et al., 2009). Yet, 93% of women indicate it is desirable for providers to ask about perinatal mental wellbeing and 97% feel comfortable answering questions about it (Mann, Adamson, & Gilbody, 2015). Most women indicate a preference for receiving mental health care at their obstetrics, primary care, or family medicine clinic, either from their medical provider or a behavioral health specialist located in the clinic (Goodman, 2009; Ko et al., 2012). While unexplored in the anxiety population, studies on perinatal depression indicate the greatest barriers to women receiving specialized mental health services are lack of time and stigma (Goodman, 2009; Ko et al., 2012).

Anxiety detection in the perinatal period is not only missing in the literature, screening and follow up during routine medical practice is uncommon (Ford, Lee, Shakespeare, & Ayers, 2017; Ford, Shakespeare, Elias, & Ayers, 2016). Perinatal mental health screening is often limited to depressive symptoms, though scholars and practitioners have argued for the need for perinatal anxiety screening (O'Connor et al., 2002; O'Connor, Rossom, Henninger, Groom, & Burda, 2016). The U.S. Preventive Services Task Force, a group responsible for reviewing empirical evidence on existing practices and making formal, evidence-based practice recommendations, currently recommends primary care physicians screen all patients and provide follow up care for depression during the perinatal period, but a formal recommendation has not been issued on perinatal anxiety because there are so few existing studies on the topic (Siu et al., 2016; U.S. Preventative Task Force, 2009). However, a similar group in the U.K., the National Institute for Health and Care Excellence (NICE), who reviews high-quality research conducted worldwide has recommended guidelines for universal perinatal anxiety screening and follow-up (NICE, 2014). They recommend a stepped care approach such that patients are “stepped up” to the level of care they need based on the intensity of their symptoms, which results in patients

receiving the least intensive treatment needed. Stepped-care for perinatal anxiety involves giving the patient a specific anxiety-screening tool, the Generalized Anxiety Disorder Scale (GAD-2 and 7; Spitzer, Kroenke, Williams, & Löwe, 2006), which is the gold standard of anxiety measurement in general healthcare settings. For those who screen positive for anxiety, steps for using the least intense mental health resources based on the patient's level of symptomatology are recommended (NICE, 2014). For example, depending on risk, patients may receive psycho-education materials, medication management, internal or external mental health referrals, or in-patient psychiatric treatment (NICE, 2014). A common intervention in a stepped, collaborative care program may consist of initial primary care consultation, follow-up with a care manager, patient education, decision support for primary care providers, and consultation and referral to a behavioral health specialist for severe cases (Gjerdingen et al., 2009).

The stepped care model is often used within a collaborative care setting. Collaborative care is an extensively studied team-based approach in which mental health professionals, psychiatrists, and physicians provide mental health treatment within the same clinic (Katon et al., 1999; Penkunas & Hahn-Smith, 2015; Unützer et al., 2002). Rates of referral and follow up care for women with positive screening results for other common mental health problems such as perinatal depression are significantly higher when screening, diagnosis, and treatment are provided in the same setting, such as in collaborative care settings (Myers et al., 2013). Further, women prefer screening, follow-up, and treatment for mental health conditions all at the same clinic where they receive physical health care (Goodman, 2009; Ko et al., 2012). While over 80 studies have evaluated collaborative care for depression, only a few studies have evaluated collaborative care for perinatal depression (Grote et al., 2014; Grote et al., 2015; LaRocco-Cockburn et al., 2013), and no known studies have specifically tested collaborative care for

perinatal anxiety. Studies on collaborative care for perinatal depression have shown strong support (Grote et al., 2014, Grote et al., 2015, LaRocco-Cockburn et al., 2013), and while not specific to perinatal populations, other findings on collaborative care have shown reductions in anxiety symptoms (Archer et al., 2012; van't Veer-Tazelaar et al., 2009).

Given the value of screening for common mental health problems in obstetrics and family medicine, it is important to implement screening in real-world practice settings. Implementation science is an area of research that seeks to answer the question of *how* interventions are best translated into practice (Polaha & Nolan, 2014). This is particularly important since evidence-based interventions often originate in academic settings where experimental conditions may be stringent and are therefore often less translatable to community settings (Polaha & Nolan, 2014). Further, funding sources of university-based research are not typically available in the long-term implementation and use of a practice, which can prevent the sustainability of interventions in real-world settings (Shediac-Rizkallah & Bone, 1998). RE-AIM (Glasgow, Vogt, & Boles, 1999) is an implementation framework that originated in the public health setting and has been used extensively to evaluate methods for implementing new practices into community practice settings, including collaborative care programs. RE-AIM evaluation domains consist of Reach, Efficacy or Effectiveness, Adoption, Implementation, and Maintenance components (Glasgow et al., 1999). Adoption identifies the willingness of stakeholders and staff to adopt a new program. This translates into addressing how a newly implemented protocol is integrated into a healthcare system by examining factors such as attitudes, knowledge, and competency (Glasgow et al., 1999). When a new practice is being implemented, it is helpful to assess stakeholders' perceptions of it to understand potential facilitators and barriers to adopting it. Such information can be useful in determining whether the protocol needs to be adjusted.

In the current study, the adoption component of RE-AIM was examined. This included training 13 family medicine residents to screen and follow-up for perinatal anxiety with the GAD-2 and GAD-7 using a stepped-care framework in three collaborative care family medicine clinics. Following the training, residents were asked about their perceptions of facilitators and barriers of the new perinatal anxiety screening and care management protocol. To further understand how providers might adopt the universal screening protocol, they were also asked whether patient characteristics such as race and ethnicity might affect their likelihood of screening. The research question is as follows: What are the views of providers in three family medicine clinics of implementing perinatal anxiety screening and care management, including facilitators and barriers of screening in general and those specifically related to the new practice being implemented?

Methods

Procedures

The current study examined family medicine residents' perceptions of adopting a perinatal screening protocol. The anxiety screening and management protocol was based on NICE guidelines and was implemented in three family medicine clinics. The health clinics follow a collaborative care model in which behavioral health consultants (BHCs) are on-site to follow-up with patients whose screening indicated they are at risk for anxiety. To implement the perinatal anxiety screening and care management protocol, family medicine residents were trained to screen patients using the GAD-2 and then, if positive, the GAD-7. The training consisted of a one time, 60-minute session, including the background on perinatal anxiety and how to effectively screen and follow-up with patients. Then, automatic screening reminders for the GAD-2 and GAD-7 were implemented into patients' electronic health records. Immediately

following the training, residents responded to open-ended questions about their perceptions of adopting the protocol. The survey questions assessed their views on the perinatal anxiety protocol, including the feasibility and potential barriers surrounding screening for perinatal anxiety. Open-ended surveys were used in this study to increase participation since providers preferred them to other methods (e.g., interviews).

Participants

Participants in the study were the 13 family medicine residents who serve patients at three family health clinics affiliated with Sparrow Health System in Ingham County, Michigan. For the qualitative surveys, all on-site family medicine residents were recruited following the training and provided their responses (n=13). All family medicine residents were compensated \$10 for completing the open-ended survey in the form of cash or a Starbucks gift card. See table 1 for demographic characteristics of the participating medical residents. Both the university and hospital Institutional Review Boards approved this study.

Measures

Demographics. Pertinent demographics were gathered from family medicine resident participants prior to beginning the open-ended survey. This included questions regarding family medicine residency status, year in residency, gender, age, race/ethnicity, gross household income, and whether they were born in the U.S.

Survey. An open-ended qualitative survey was used to gather responses from family medicine residents following the perinatal anxiety training. This included both the option to complete the questions online via Qualtrics or in-person via pen and paper. The open-ended questions were informed by prior research on facilitators and barriers to perinatal depression screening (e.g. Byatt et al., 2012). Initial questions included the following: 1) Please describe

your prior training in mental health, and, 2) Please describe your prior training in perinatal anxiety. Following this, ten questions were asked that address facilitators and barriers of screening. These included: 1) What are your views on screening for perinatal anxiety during routine healthcare visits?, 2) What are the primary reasons you screen and provide follow-up care for anxiety?, 3) What biological, psychological, social, or demographic factors do you typically consider when deciding whether to screen for or recommend follow-up care for perinatal anxiety?, 3a) Do you think physicians' clinical decision making related to screening and follow-up for perinatal anxiety differs for patients of different races or ethnicities?, 4) How prepared, or not prepared, do you feel about providing screening and follow-up for perinatal anxiety during routine healthcare visits? Did your level of competence and/or knowledge change after the training?, 5) What are your views on the new perinatal anxiety screening and management protocol?, 5a) How feasible is it in your setting?, 6) What impact, if any, do you think the perinatal anxiety screening and management protocol will have on patients in your clinic?, 7) What barriers, if any, exist to following the anxiety screening and management protocol in your clinic?, 8) What are facilitators or things that support you in following the anxiety screening and management protocol in your clinic, if any?, 9) What percentage of your colleagues do you think will adopt the new screening protocol and implement it as designed?, and finally, 10) What changes do you think should be made to the protocol and why?

Data Analysis

Braun and Clarke's (2006) method of thematic analysis was used in the current study. Thematic analysis is a qualitative method for uncovering phenomena that are not well understood, such as the views of providers surrounding the perinatal anxiety screening and care management protocol in the current study. Thematic analysis was used to examine emerging

themes from the data (Braun & Clarke, 2006). Thematic analysis involves six main steps. First, researchers become familiar with the data through data collection and field notes. Second, independent coders generate initial codes. Third, coders meet and agree upon themes that have emerged from the data. Fourth, coders follow a recursive process of returning to the data and coding the interviews into themes, line-by-line, checking for erroneous or additional themes throughout the process. Fifth, coders define and name themes. Finally, the production of the report is finalized (Braun & Clarke, 2006). In the current study, this protocol was followed in order to extract participant perspectives from the data.

Results

Results of the survey questions with medical providers included eight overall themes that fit into two categories: 1) Facilitators and 2) Barriers. See table 2 for an overview of the themes and their descriptions.

Facilitators

Belief in the value of screening. The first theme represents how residents perceived that screening and follow up care for perinatal anxiety is important for the wellbeing of mothers and children. When asked why they believe it improves overall wellbeing for the mother and child, one resident said it is “important to screen and identify mothers that have perinatal anxiety.” A second resident said, screening “leads to better outcomes for mother and baby.” Participants also mentioned the importance of focusing on mental health, “Mental health is important in a person's overall wellbeing.” One participant mentioned, “It should be done at least once during every prenatal course and postnatal course” and another said, “I feel like every pregnant or new mother should be screened.” Overall support of the protocol was mentioned such as from one resident who stated, “I am a fan, [screening] leads to better healthcare.” Finally, one focused on the need

for anxiety screening saying that, “I think it makes sense because we pay so much attention to depression but not anxiety when it can be just as debilitating to mothers.”

Feel prepared after receiving training. The second theme in regards to perceived facilitators of adopting the protocol related to the residents feeling prepared to screen patients for perinatal anxiety and provide follow up care after having received the training. The 60-minute training residents received for the current study helped them feel more prepared and ready to follow the perinatal anxiety protocol. One resident mentioned, “I feel prepared and generally more comfortable now.” Another stated, “the training helped me identify how I could do more to identify patients who are at risk and would not be picked up otherwise.” Family medicine residents also reported they had never been or were very minimally trained in the symptoms of perinatal anxiety and how to detect them. As one resident stated, “I do not remember discussion in medical school.” Another participant mentioned that they “have learned more about perinatal depression than anxiety”.

Aligns with current clinic practices. The next theme related to the residents’ perceptions that incorporating the perinatal anxiety screening is feasible since it aligns well with their current practice of screening for perinatal depression. The residents felt the perinatal anxiety protocol would not disrupt their current workflow, which was highly important to them. One resident reported, “We already screen for depression so it will be a good reminder to also screen for anxiety.” One participant also talked about the electronic health record system, “We use a standard note template, putting a reminder in the template at time frames patient should be screened has been helpful.” Another resident mentioned that there are simply “No barriers in our clinics.”

Will improve patient care. The residents expressed a strong belief that the new perinatal anxiety screening would improve the quality of care for patients. For this theme, residents stated that the impact of the current protocol would help patients avoid falling through the cracks and, through enhanced capability to detect their symptoms, they would be able to improve the overall quality of care for patients. One resident stated, “[perinatal screening] will identify patients who need help earlier.” Another resident said, “patients will feel well cared for, having not only their prenatal care addressed but also their mental health.” As one participant articulated, “I believe that it will identify patients that have this issue and allow the provider to provide treatment to patients who otherwise might fall through the cracks.”

Existing staff support. Residents mentioned that a facilitator to the current perinatal anxiety screening protocol is having behavioral health consultants on site at their family health clinics. One resident mentioned that a facilitator is that “we have BHCs who can see patients” and another said that having “BHCs in our office [and medical assistants] understanding it is protocol”. Residents also reported that other facilitators of this protocol include having other staff in the clinics to provide the screening tool before the resident enters the room. An example of this is a resident stating that a facilitator is that the “Office staff gives screening tools prior to me entering the room” as well as “It is doable as long as office staff can give the screening tools before I enter the room.”

Barriers

Time constraints. When asked about barriers to the current perinatal anxiety screening protocol, residents mentioned time as a constraint. In order to screen for perinatal anxiety and follow-up with patients, it takes time out of their busy schedule. One resident stated, “maybe just

time, having to add in another element of screening.” Many others mentioned simply “time” as a barrier in their current daily workflow.

Making sure other staff are trained. A second barrier that came up in the current study was the concern that other staff members in the family medicine clinics were not trained when the residents were. Since the existing training model in the clinic only includes family medicine residents in seminars, they were the only staff trained on the current protocol. However, residents mentioned it is helpful to have the other nurses and staff trained and on board so the protocol can run smoothly. A quote that exemplifies this is “Getting staff trained at implementing the new protocol.” Additionally, as part of training other staff they wanted help “Reminding staff to please include the screening forms when rooming.”

Potential for inequitable screening. When asked what factors they consider when deciding who is screened, participants mentioned that things such as social support, previous history of mental disorders, and socioeconomic status are considered. One resident stated, “I try not to discriminate, but sometimes when women seem stable in life in general (Stable relationship, good job, good support system) I may not think about screening.” When asked whether screening and follow-up differs based on patient race/ethnicity, residents mentioned that they did think this played a role in clinical decision-making. One said “absolutely” while many others simply responded “yes”. One particular resident mentioned that “Yes, I also feel certain ethnicities are more likely to admit to issues with anxiety and depression.”

Discussion

The current study aimed to assess family residents’ perceptions of adopting a perinatal anxiety protocol into their clinics. It is important to gather the perspectives of stakeholders who will be asked to adopt a new practice, particularly to assess barriers to see whether the protocol

needs to be changed in order to increase the rate of adoption by providers. Participants' responses revealed that the perinatal anxiety screening and care management protocol was viewed favorably and that it seemed feasible in their settings. Themes indicated specific facilitators and a few barriers related to the protocol. In general, family medicine residents reported facilitators that included the belief in the value of screening, feeling prepared after receiving training, and the protocol aligned with their clinic's current practice. Additionally, themes emerged regarding the improvement of patient care and having existing staff support, such as BHCs on-site. Barriers to the current screening protocol include time constraints, training other staff in the clinics, and the potential for inequitable screening.

The overwhelming result of this study indicates positive attitudes toward perinatal anxiety screening by family medicine residents. Residents not only believed in the value of screening, they also cited it as a way to prevent women from falling through the cracks and improving overall patient care. While there is no known literature on existing perinatal anxiety screening training, prior literature on perinatal depression screening has been conducted (e.g. Avalos et al., 2016; Flanagan & Avalos, 2016). In a study on the views of obstetricians/gynecologists on depression screening, positive attitudes toward depression screening, ease of screening, and training on treating depression were significant independent predictors of depression screening practices (LaRocco-Cockburn et al., 2003). The literature also underscores that screening should be incorporated into routine office workflow (Flanagan & Avalos, 2016). In the current study, this was described as a vital aspect of the perinatal anxiety screening protocol. Family medicine residents mentioned that since they already screen for depression and have mental health staff on-site it will ease the adoption of the new screening protocol.

Similar to the results of this study, in prior studies, lack of time has been cited as a reason that medical providers do not choose to screen and/or provide follow up care (Byatt et al., 2012; LaRocco-Cockburn et al., 2003). At the same time, residents also emphasized that they did not anticipate challenges in adding the perinatal anxiety screening and providing follow-up because of the existing practices and resources in their clinic. For example, they reported that they already have a depression screening protocol in place and are able to rely on on-site behavioral health consultants as well as other staff (e.g. nurses) to provide the screening tool prior to them meeting with the patient. These factors could help alleviate some of the challenges related to time. This indicates the importance of designing new practices that align with the current workflow of a clinic.

While stigma has been cited in previous studies as a reason for perinatal women with depression not receiving screening or follow-up, this theme did not arise in the current study (Goodman, 2009; Ko et al., 2012). In fact, the family medicine residents reported that it is important to screen for mental health problems and that it may improve patient outcomes. The team-based collaborative care approach in which mental health professionals, psychiatrists, and physicians collaboratively provide mental health treatment may have been helpful in this regard (Katon et al., 1999; Penkunas & Hahn-Smith, 2015; Unützer et al., 2002). The collaborative care approach was originally designed to treat older couples with depression, but was later expanded to perinatal women and other populations (Unützer et al., 2002). In the current study, the family health clinics used the collaborative care model. In fact, they are highly integrated care facilities with BHCs on-site (Blount, 2003; Marlowe et al., 2014; Martin, White, Hodgson, Lamson, & Irons, 2014). This level of integration with physical and mental health could also result in a reduction of the stigma surrounding mental health, making it more likely that physicians will

screen and follow-up with women regarding their mental health conditions such as anxiety, and more likely that patients engage in follow-up care. Residents stressed that having BHCs on-site was an important facilitator to the success of the current protocol.

Lack of training has also been reported as a barrier to screening and follow-up in prior studies (Byatt et al., 2012; Flanagan & Avalos, 2016; LaRocco-Cockburn, Melville, Bell, & Katon, 2003). In the current study, family medicine residents reported not receiving training on perinatal anxiety prior to the current protocol. This coincides with the lack of research on perinatal anxiety screening in health clinics that serve these populations. This topic has been previously overlooked. However, education and skills training is an important facilitator to screening and follow-up for mental health conditions in perinatal populations (Byatt et al., 2012; LaRocco-Cockburn, Melville, Bell, & Katon, 2003). In the current study, a 60-minute training session revealed that it improved the self-reported competence and preparedness of medical providers in screening and following-up for perinatal anxiety. This reveals the value in providing training to medical providers in screening for perinatal anxiety. Therefore, efforts should be made to implement universal perinatal anxiety screening protocols in OB/GYN and family medicine clinics. Additionally, in order to prevent a lack of training prior to residency and practice in health clinics, it may be important to advocate for medical school education to include perinatal anxiety and other mental health problems.

Limitations

The current study setting included three healthcare clinics with collaborative care systems already in place, which includes having BHCs on-site. Findings may not generalize to other settings without this model of care and staff resources in place. Future research in other settings

could provide insight into the effectiveness of implementing a universal perinatal anxiety screening protocol.

Adoption is an important aspect of the RE-AIM implementation framework and promotes getting all stakeholders and staff on board when implementing a new protocol (Glasgow et al., 1999). Residents indicated that other staff needed to be trained in the current protocol, since only the family medical residents attended the 60-minute training session. This study was limited by the training practices of the target clinics, which only engaged residents in most trainings. Future research should involve all staff members at clinics serving perinatal populations in the training of new protocols instead of solely the physicians. It is also important to assess the perspectives of other staff members regarding the adoption of the new practice.

Future Directions

Future research is needed to continue to understand best practices for implementing universal anxiety screening protocols for perinatal populations with high rates of adoption among providers. It is imperative to educate and train current and future medical providers on the topic of screening and follow-up for perinatal anxiety in order to prevent adverse outcomes for mothers and children. One potentially fruitful area for future research is to focus on training during medical school or residency in order to facilitate the education of a new generation of providers. Specifically, OB/GYN and family medicine providers should be trained as they see a high volume of perinatal populations.

Conclusion

Perinatal anxiety is a significant problem that is often overlooked in the literature and in practice. However, perinatal anxiety has long-term adverse effects influencing the mother and baby. In the current study, a perinatal anxiety screening and care management protocol was

implemented into three family medicine clinics served by medical residents. This included training residents to screen and follow-up for perinatal anxiety. Qualitative results of the perspectives of providers included important facilitators and barriers of the perinatal anxiety protocol. This provided insight into how this protocol was perceived, and showed promise for the rates of adoption by providers.

APPENDICES

APPENDIX A

Tables

Table 1.1. *Guidelines for Stepped Care Perinatal Anxiety Screening and Follow-up in Healthcare Settings.*

**Notes.* 1. Steps should be taken to engage social support networks during treatment.

When?	How?	Follow-up?		
Woman's first contact with primary care physician or at booking <u>and</u> during early postnatal period	GAD-2 Screener: - During the past month, have you been feeling nervous, anxious or on edge? (An answer of 'Not at all' scores 0; 'Several days' scores 1; 'More than half the days' scores 2; 'Nearly every day' scores 3.) - During the past month have you not been able to stop or control worrying? (An answer of 'Not at all' scores 0; 'Several days' scores 1; 'More than half the days' scores 2; 'Nearly every day' scores 3)	GAD-7: If score of 3 or above on 2-item screener, follow-up with the full GAD-7	GAD-7 Score of <10 (below cut-off for anxiety) Assess risk <i>Low intensity intervention</i> -Brief education -Facilitated self-help <u>OR</u> *Consider referral to high intensity treatment based on clinical judgment or if symptoms persist over 2 weeks	GAD-7 Score of ≥10 (above cut-off for anxiety) Assess risk <i>Low intensity intervention</i> -Brief education -Facilitated self-help <u>OR</u> <i>High intensity intervention</i> -Meet with BHC -Warm referral to psychological services (CBT or IPT) -Medication management *Always disclose pros and risks of medication
Continue to ask about emotional wellbeing at all contacts after first visit	*Repeat above steps at each visit			

2. These guidelines are based on NICE (2014) and other empirical studies on perinatal anxiety screening and management (e.g., Records & Hanco, 2016).

Table 2.1. *Demographic Characteristics of Perinatal Women.*

<u>Demographic Characteristic</u>	<u>Percentage/Average</u>
Age	M = 24.76 years
Sex	100% Female
	0% Male
Ethnicity	77% Not Hispanic/Latino
	13% Hispanic/Latino
Visit Type	84.78% Prenatal
	15.22% Postpartum

Table 3.1. *Demographic Characteristics of Family Medicine Residents*

<u>Demographic Item</u>	<u>Number of Responses</u>	<u>Percentage/Average</u>
Identified as a Family Medicine Resident	13	100.0%
Year in residency	13	
1	3	23.0%
2	2	15.4%
3	8	61.5%
4	0	0%
Gender	13	
Male	5	38.5%
Female	8	61.5%
Other	0	0%
Age	13	31.2 yrs
Race/Ethnicity	13	
White/Caucasian	8	61.5%
Black/African	2	15.4%
Hispanic/Latinx	0	0%
Asian	2	15.4%
Native American	0	0%
Pacific Islander	0	0%
Other	1	7.7%

Table 3.1 (cont'd)

Gross annual household income	13	
Less than \$15,000	0	0%
\$15-29,999	0	0%
\$30-49,999	1	7.7% \$30-49,999
\$50-74,999	5	38.5% \$50-74,999
\$75-99,999	2	15.4% \$75-99,999
\$100-149,999	4	30.8% \$100-149,999
\$150,000+	1	7.7% \$150,000+
Born in the U.S.	13	
Yes	8	61.5%
No	5	38.5%

Table 4.1. *Qualitative Themes and Descriptions*

<u>Theme</u>	<u>Description</u>	<u>Example</u>
<i>Facilitators</i>		
1. Belief in the value of screening	The residents reported it is important to screen for anxiety because of the general health and wellbeing of the patient.	“Important to screen and identify mothers that have perinatal anxiety” “Leads to better outcomes for mother and baby”
2. Feel prepared after receiving training	The training provided in the current perinatal anxiety protocol assisted residents in feeling more prepared and competent at screening and follow-up.	“I feel prepared to screen and send to a BHC for follow up. I felt like the training raised my awareness to do this.”
3. Aligns with current clinic practices	Residents reported that because they already have a screening protocol in place for depression, it makes it easier to implement the anxiety screening as well.	“We already screen for depression so it will be a good reminder to also screen for anxiety”

Table 4.1 (cont'd)

4. Will improve patient care	Residents mentioned the protocol helping patients avoid falling through the cracks and improving overall quality of care.	“it will identify patients who need help earlier” “I presume patients will feel well cared for, having not only their prenatal care addressed but also their mental health.”
5. Existing staff support	Residents mentioned having mental health staff and other staff helping to provide screening tool before the resident enters the room.	“we have BHCs who can see patients” “Office staff gives screening tools prior to me entering the room.”

Barriers

1. Time Constraints	Residents mentioned time as a constraint in screening and follow-up for anxiety.	“Maybe just time, having to add in another element of screening”
2. Making sure other staff is trained and on board	Residents mentioned it is helpful to have the other nurses and staff trained and on board so the protocol can run smoothly.	“Getting staff trained at Implementing the new protocol.”

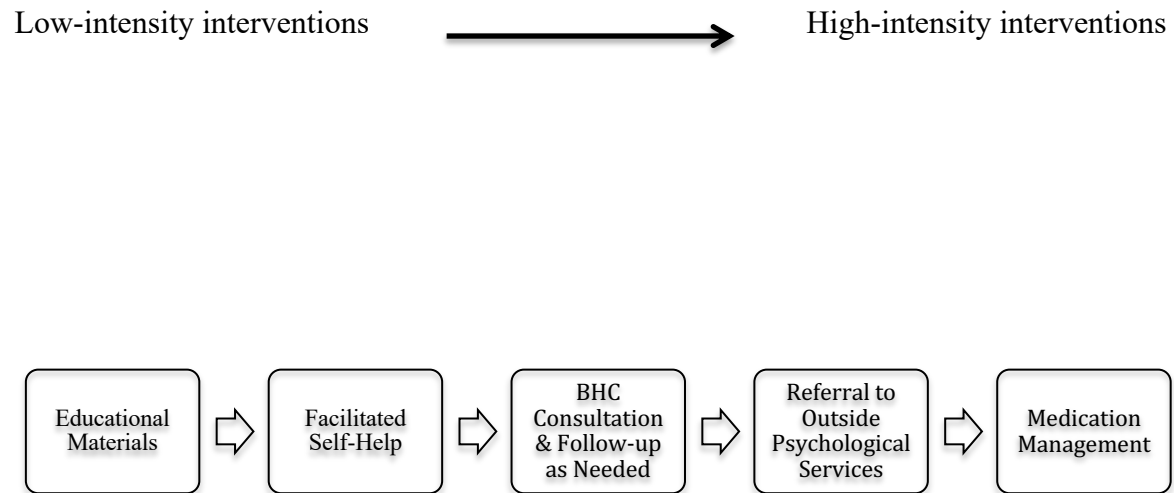
Table 4.1 (cont'd)

3. Potential for inequitable screening	Things such as social support, previous history of mental disorders, and socioeconomic	“I try not to discriminate, but sometimes when women seem stable in life in general
	status are considered when deciding what patients to screen. When asked if decision-making for	(Stable relationship, good job, good support system) I may not think about screening.”
	screening differed based on race/ethnicity residents agreed that it does play a role.	“Yes, I also feel certain ethnicities are more likely to admit to issues with anxiety and depression.”

APPENDIX B

Figures

Figure 1. *Stepped Care Follow-up Components.*



APPENDIX C

Edinburgh Postnatal Depression Scale (EPDS)

Since you are either pregnant or have recently had a baby, we want to know how you feel. Please place a CHECK MARK (✓) on the blank by the answer that comes closest to how you have felt IN THE PAST 7 DAYS—not just how you feel today. This is a screening test; not a medical diagnosis. If something doesn't seem right, call your health care provider regardless of your score.

1. I have been able to laugh and see the funny side of things:

- ☐ As much as I always could
- ☐ Not quite as much now
- ☐ Definitely not so much now
- ☐ Not at all

2. I have looked forward with enjoyment to things:

- ☐ As much as I ever did
- ☐ Rather less than I used to
- ☐ Definitely less than I used to
- ☐ Hardly at all

3. I have blamed myself unnecessarily when things went wrong:

- ☐ Yes, most of the time
- ☐ Yes, some of the time
- ☐ Not very often
- ☐ No, never

4. I have been anxious or worried for no good reason:

- ☐ No, not at all
- ☐ Hardly ever
- ☐ Yes, sometimes
- ☐ Yes, very often

5. I have felt scared or panicky for no very good reason:

- ☐ Yes, quite a lot
- ☐ Yes, sometimes
- ☐ No, not much
- ☐ No, not at all

6. Things have been getting on top of me:

- ☐ Yes, most of the time I haven't been able to cope at all
- ☐ Yes, sometimes I haven't been coping as well as usual

APPENDIX C (cont'd)

- ☐ No, most of the time I have coped quite well
- ☐ No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping:

- ☐ Yes, most of the time
- ☐ Yes, sometimes
- ☐ Not very often
- ☐ No, not at all

8. I have felt sad or miserable:

- ☐ Yes, most of the time
- ☐ Yes, quite often
- ☐ Not very often
- ☐ No, not at all

9. I have been so unhappy that I have been crying:

- ☐ Yes, most of the time
- ☐ Yes, quite often
- ☐ Only occasionally
- ☐ No, never

10. The thought of harming myself has occurred to me:

- ☐ Yes, quite often
- ☐ Sometimes
- ☐ Hardly ever
- ☐ Never

*Note: Items 3, 4, and 5 are included for the EPDS-3A subscale to detect anxiety (Matthey, 2008).

APPENDIX D

Generalized Anxiety Disorder Scale (GAD-7)

Over the last 2 weeks, how often have you been bothered by the following problems?

Not at all = 0	Several days = 1	Over half the days = 2	Nearly every day = 3	
1. Feeling nervous, anxious, or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it's hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

*Note: Questions 1-2 are used for the GAD-2 screener, with a score of three or more indicating further screening by the GAD-7 (NICE, 2014).

APPENDIX E

Semi-Structured Survey Questions for Providers

1. What are your views on screening for perinatal anxiety during routine healthcare visits?
2. What are your motivators for screening and follow-up?
3. Do you feel competent at screening and following up for perinatal anxiety during routine healthcare visits? Did your level of competence change after the training?
4. Do you feel you have adequate knowledge about screening and follow-up for perinatal anxiety during routine healthcare visits? Did your knowledge improve after the training?
5. What are your views on the new perinatal anxiety screening and management protocol?
 - a. How feasible is it in your setting?
6. What impact, if any, do you think the perinatal anxiety screening and management protocol will have on patients in your clinic?
7. What barriers, if any, exist to following the anxiety screening and management protocol in your clinic?
8. What changes do you think should be made to the protocol and why?

APPENDIX F

Educational Materials for Providers



Did you know?

- About a **quarter** of women are missed during routine depression screenings that have perinatal anxiety
- Many women struggle with perinatal anxiety but don't know **what it is**
- Women who identify as **ethnic/racial minorities** and/or those with a **lower household income** may be at greater risk for perinatal anxiety and depression
- If you have a history of mental health problems, you are at **higher risk** for perinatal anxiety

What Can I Do?

1. **Talk with your healthcare provider**
 - Your healthcare provider can help you with a diagnosis and may suggest medication and/or therapy
2. **Seek counseling/talk therapy**
 - Find a mental health professional, such as a Marriage and Family Therapist (MFT), social worker, psychologist or psychiatrist.
 - There are many different evidence-based treatments, including Cognitive Behavioral Therapy (CBT) and Emotionally Focused Couples Therapy (EFT).
3. **Seek immediate emergency services if you feel you or your child are at risk**

Hotlines

1-800-273-TALK (8255)
1-800-950-NAMI (6264)

Perinatal Anxiety Facts



APPENDIX F (cont'd)

What is Perinatal Anxiety?

Perinatal anxiety means you have anxiety symptoms during pregnancy or postpartum (up to a year after birth).

What do we mean by anxiety?

- Can range and be a wide variety of diagnoses of generalized anxiety disorder (GAD) and obsessive compulsive disorder (OCD).
- Also includes posttraumatic stress disorder (PTSD), panic disorder, phobias, and other non-specific anxiety disorders



What are the most common symptoms?

- Excessive anxiety and worry
- Difficulty controlling worry
- Associated with three or more of the following symptoms:
 - » Restlessness, feeling keyed up or on edge
 - » Being easily fatigued
 - » Difficulty concentrating or mind going blank
 - » Irritability
 - » Muscle tension
 - » Problems with sleep
- These symptoms cause distress or impairment in social, occupational, and other functioning

How can I be diagnosed?

- Talk with your healthcare provider, only they can diagnose you appropriately
- Because symptoms can vary from person to person and may be attributable to something else, a healthcare provider can help you see if you fit the criteria for perinatal anxiety
- Once you are diagnosed, your healthcare provider will talk to you about next steps. This could include medication management and referral to outside therapy services
- Remember to **speak up** about your symptoms! You are in charge of your treatment and what feels right to you

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