OPTIMIZING POSTPARTUM CARE: EXAMINING THE EFFECTS OF POSTPARTUM CARE ON POSTPARTUM DEPRESSION AND ANXIETY

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ABSTRACT

Postpartum is a vulnerable period that calls for careful monitoring, support, and anticipatory guidance. More than half of pregnancy-related deaths occur postpartum, with substantial morbidity occurring in the early postpartum period. Depression during or immediately after pregnancy is a common medical complication affecting one in seven women in the United States. There is a large body of research that supports earlier and more frequent postpartum care for all women. Healthcare governing bodies, including the American College of Nurse Midwives (ACNM) and the American College of Obstetricians and Gynecologists (ACOG) currently have guidelines in place for more frequent postpartum visits.

There is a gap between research evidence and current practice related to postpartum visits; therefore, the project was translating evidence into practice. The project design was comparative, pre-and post- (retrospective and prospective). The project's primary aim was to compare postpartum depression rates in women who received postpartum care with a six-week postpartum visit only (the pre-group) with women who received optimized postpartum care with the addition of a one-week visit in the office and a three-week virtual or in office visit if needed (the post-group).

Mothers in the pre-practice change groups had one six-week postpartum visit. Mothers in the post-practice change group were scheduled for a one-week appointment in the office after delivery and a six-week comprehensive postpartum visit. Mothers with an Edinburgh Postnatal Depression Scale (EPDS) score of eight or greater, a history of a postnatal mood disorder, or a

history of a mood or psychiatric disorder all returned for an additional three-week postpartum visit.

The project included 297 women, 185 in the pre-practice change group and 112 in the post-practice change group. The results revealed a decrease in the mean EPDS score at six weeks postpartum in the post-practice change group (M = 6.2), compared to the mean EPDS score in the pre-group (M = 7.8). Early postpartum visits had a statistically significant impact overall on postpartum depression symptoms ($p = 0.28$). The addition of early postpartum visits positively influenced the presence and severity of postpartum depression symptoms, and therefore could decrease maternal and infant morbidity and mortality.

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Chapter I: Introduction

The fourth trimester, the time between birth and 12 weeks postpartum, is a term about which many women know very little. Nonetheless, it is a critical time frame. By the time most women arrive for their postpartum visit at six weeks after childbirth, they may be struggling with breastfeeding challenges, bonding, coping with sleepless days and nights, the anxiety of being a "good" mother, and/or dealing with baby blues or postpartum depression. If women were seen earlier postpartum routinely, there is education that could be provided to them surrounding these topics. The time between birth and 12 weeks postpartum is a vulnerable period that calls for careful monitoring, support, and anticipatory guidance by all postpartum care providers. The purpose of this project was to examine whether providing more touchpoints during the postpartum period would impact the incidence of postpartum depression and anxiety, as well as how additional postpartum contact will affect breastfeeding continuation rates. This chapter includes background information on the problem, the significance of the problem, an organizational needs assessment, clinical question, the evidence-based practice model, the theoretical framework utilized, and the definition of terms in context of the project.

Description and Statement of Problem

According to the Centers for Disease Control and Prevention (CDC), 17.2 women died for every 100,000 live births in the United States between the years of 2011 and 2015. That is approximately 700 women per year who died of a pregnancy-related issue in the United Sates (Leins, 2019). Of particular interest is the fact that more than half of pregnancy-related deaths occur after the birth of the infant, with substantial morbidity occurring in the early postpartum period (Langan et al., 2016). Depression during or immediately after pregnancy is a common

medical complication affecting one in seven women (Langan et al., 2016). Postpartum depression is associated with significant neonatal morbidity including failure to thrive, attachment disorder, and developmental delays seen up to one year of age. Maternal morbidity is also seen with postpartum depression including fatigue, decreased concentration, sleep disturbances, and decreased maternal-infant bonding. "Maternal suicide is a more common cause of peripartum mortality than postpartum hemorrhage or hypertensive disorders" (Langan et al., 2016, p. 852).

There is a large body of research, both qualitative and quantitative, that supports earlier and more frequent postpartum care, even for low-risk women. Many healthcare governing bodies, including the American College of Nurse-Midwives (ACNM), the American College of Obstetricians and Gynecologists (ACOG), the National Institute for Health and Care Excellence (NICE), and the World Health Organization (WHO), currently have guidelines in place for more frequent postpartum visits. The evidence supports these guidelines, now it is time to implement them, measure the outcomes and adjust as necessary to give patients the safest, evidence-based care.

Background and Significance of Problem

Psychological distress appears to be fairly common after childbirth. Women report experiencing a range of psychological problems after birth, such as anxiety, post-traumatic stress, adjustment disorders, and depression. The incidence of "baby blues", feelings of sadness or moodiness after the birth of a child, ranges from 5 to 80 percent and the prevalence of postpartum depression varies from 1.9 to 82.1 percent with the lowest rate reported in Germany and the highest rate reported in the United States (Slomian et al., 2017). A qualitative study evaluating mothers' needs during the postnatal period and comparing the needs of mothers with

and without an experience of psychological distress, found that all mothers seemed to have similar needs, but have them at different levels of intensity. Women feel neither sufficiently informed, nor sufficiently supported, not only from a psychological point of view, but from a practical point of view. They feel an overall lack of support (Slomian et al., 2017).

Postpartum care is essential to evaluate for delivery complications and breastfeeding. However, studies have shown that postpartum care that includes interventions for reducing sleep disorders of mothers after childbirth, education about increasing physical activity, aromatherapy, and yoga reduced rates of postpartum depression (Parsa et al., 2019). Research has also shown that breastfeeding training based on the Beliefs, Attitudes, Subjective Norms, and Enabling Factors (BASNEF) model decreased the intensity of postpartum blues (Parsa et al., 2019). Health professionals and midwives can minimize the adverse effects of postpartum depression by screening for postpartum depression and early mental disorders during the postpartum period (Parsa et al., 2019).

The Edinburgh Postnatal Depression Scale (EPDS) is a validated screening tool used in the United Stated for postpartum depression (MGH Center for Women's Mental Health, 2018). It has high specificity and sensitivity for depression and takes approximately five minutes to administer. Women whose screening suggest suicidal thoughts warrant prompt evaluation with psychiatric intervention. Suicide contributes to approximately 1.5 of 100,000 maternal deaths in the United States (Brown, 2019). Women with lower income, lower education, unintended pregnancy, history of depression or anxiety, history of postpartum depression, traumatic birth events, premature birth with a need for neonatal intensive care and/or birth defects, and low levels of social support are at higher risk for postpartum depression and may need earlier or more frequent follow-up visits (Brown, 2019).

Given the urgent need to reduce maternal morbidity and mortality, ACOG revised their recommendations in May of 2018 for care in the fourth trimester and proposed new guidelines for postpartum care (Stuebe et al., 2018). Currently, despite there being frequent visits focused on women's health prenatally, postpartum care typically only includes a visit at four to six weeks after childbirth. Current ACOG recommendations are as follows: postpartum care should include (a) individualized care for each woman, (b) an initial assessment, either in person or by phone, within the first 3 weeks postpartum to address acute postpartum issues, (c) ongoing care as needed, and (d) a comprehensive well-woman visit no later than 12 weeks after delivery (Stuebe et al., 2018).

The World Health Organization (WHO) guidelines for postpartum care include seeing women at three days post-delivery, 1-2 weeks and 6 weeks after birth (World Health Organization, 2013). The National Institute for Health and Care Excellence (NICE) guidelines recommend screening all women for postpartum depression and anxiety at 10-14 days after birth (National Institute for Health and Care Excellence, 2021). Research has also found that postpartum visits in the first few weeks after birth may encourage women to meet their breastfeeding goals (Stuebe et al., 2018). A national survey revealed that less than one half of women who attended a postpartum visit received information about postpartum depression, birth spacing, healthy eating, exercise, or changes in their sexual response or emotions (Stuebe et al., 2018). "In a randomized controlled trial, 15 minutes of anticipatory guidance before hospital discharge, followed by a phone call at two weeks, reduced symptoms of depression and increased breastfeeding duration through six months postpartum among African American and Hispanic women" (Stuebe et al., 2018, p. 142).

Given that the United States has elevated maternal morbidity and mortality rates, it is vital to improve postpartum care in order to improve healthcare outcomes, mental health and better serve mothers within the United States.

Organizational Needs Assessment

When one thinks about the culture of a system, or organization, it can feel like a very broad term and hard to define. Assessing or analyzing a culture can feel like an impossible task. There are two important factors to consider regarding organizational change. First, an organization must be able to change with the changes occurring in the world around them. Second, in order for a change leader to successfully make a change in a system, they must understand the culture in which the change will be taking place. Schein (2017), states that "culture can be analyzed at several different levels. These levels range from very tangible to the deeply embedded, unconscious, basic assumptions that we are defining as the essence of culture or its DNA" (p. 17). The three levels include culture artifacts, espoused beliefs and values, and basic underlying assumptions. These three levels were used to perform an organizational needs assessment of the practice setting in which this project took place.

System Identification

This system culture assessment and analysis was performed on a hospital owned obstetrics and gynecology practice. The practice is a part of a not-for-profit, Catholic hospital in the Midwest. The hospital is a member of a larger national hospital organization. The office provides obstetric and gynecologic care to women, from pre-adolescence to the elderly. The practice is comprised of two board certified obstetrician/gynecologists (OB/Gyn) and three Certified Nurse Midwives (CNMs). The office is overseen by the Northeast Regional Manager of Practice Operations. She is not in the office routinely but keeps in close contact with the Office

Supervisor, who oversees the day-to-day operations of the office. The office staff consists of three front office employees and eight back-office employees, including registered nurses, licensed practical nurses, and medical assistants. The front office staff are responsible for checking patients in upon arrival, scheduling procedures, and taking payments. The back-office staff are responsible for rooming patients, taking vital signs, giving injections, placing patients on the fetal monitor for non-stress tests, and triaging phone calls. The physical space of the office includes 12 patient exam rooms, two labs, three non-stress test rooms, one procedure room and four patient restrooms. Given that there are only 12 patient exam rooms, the maximum number of providers working in the office at any one time is four, due to limited space.

Artifacts

Artifacts are things that one might see, hear, and/or feel when first encountering a group or organization (Schein, 2017). The practice site has their mission visible upon entering the office, and the mission and values are on the back of every employee's name badge, to remind them of why they are there. The mission states that the healthcare organization is rooted in the loving ministry of Jesus and that its employees are committed to serving all persons with special attention to the poor and vulnerable. The Catholic health ministry dedicates itself to spiritually centered, holistic care, with the goal of sustaining and improving the health of individuals and communities. The mission also includes using actions and words to advocate for a compassionate and just society. The mission is found in everything that is done within the organization, from expressing priorities, to providing patient care and services. This mission is foundational to transforming healthcare. The organization's values include service of the poor, reverence, integrity, wisdom, creativity and dedication. These values define what is expected to be respected by every employee, from provider to medical assistant, in the practice setting.

Espoused Beliefs and Values

The beliefs of the organization are valued by the employees and embedded into the day-to-day tasks that are carried out throughout the office (Schein, 2017). Service of the poor, or generosity of spirit for those most in need, is highly valued by the office employees. Employees are involved in volunteer activities sponsored by the hospital within the community, such as coat drives, a food pantry, free blood pressure checks at the mall, or providing free pap smears at yearly events. The nurses are frequently seen, going out of their way, to find prescription assistance for patients that cannot afford their medication, or trying to find the pharmacy with the best pricing. Also, one can often see them working to find transportation for patients to get to appointments or to Maternal Fetal Medicine appointments for high risk pregnancies in a neighboring city.

Wisdom and creativity are seen in the providers implementation of evidence-based practice to provide the best care for the group's patients. The office has implemented performing loop electrosurgical excision procedures (LEEP) within the office, so that patients do not incur a surgery cost or have to be cleared for surgery and anesthesia. Creativity was seen in the physicians' determination to get approval from the ethics committee at the hospital to allow removal of fallopian tubes during cesarean section for ovarian cancer risk reduction in women who do not want any further children. This was a long battle, as the hospital is a Catholic organization and saw that procedure as a form of sterilization, which is not allowed within the hospital. Yet, prophylactic salpingectomies, as an option for women undergoing surgery with access to the fallopian tubes, are found to be best practice according to the American College of Obstetricians and Gynecologists.

Finally, dedication is seen throughout the staff. Hours have been extended within the last year, so that the office starts seeing patients at 0700, instead of 0830, and is open late with the last patient being seen at 1640, instead of 1540. These extended hours offer patients increased options to be seen without losing hours at their place of employment. Ultimately, this serves as best practice for the patients.

Basic Underlying Assumptions

According to Schein (2017), basic assumptions are beliefs and values that are so taken for granted and strongly held within the group that members cannot conceive behaving differently. The group of employees within the practice setting are a very cohesive group. They work together, go out after work together, and spend much of their time together. Because the group is so close, with many of the employees being long term employees, there is little variation in the way they think about service to patients and provide patient care. They are very friendly to new employees and draw them into their group, but the employee is expected to adapt to their underlying assumptions and take them on for themselves.

The front and back-office staff have been through the turnover of seven physicians and the hiring of five new providers in the last seven years. They know and understand what works in the office when it comes to triage, nurse visits and patient flow. It is as if they train the physicians over time to fall in line with the way the front and back office staff run the office.

Change can be difficult because the group is so cohesive. It is difficult to obtain buy-in from one or two employees, instead the whole team must be convinced of the need for change. For example, each provider typically works with one or two specific nurses. A change was implemented to rotate nurses through providers. This change would allow all nurses within the

office to be exposed to the different providers and know their likes and dislikes. This change was short-lived due to the underlying beliefs that the "old way" was better.

Current Office Practices

Each provider in the practice sees approximately 20 patients in the office per day. Each provider has their own gynecologic patients; however, obstetric patients are shared and rotate through all five providers throughout their pregnancy. Postpartum patients are seen by the provider who is present at their delivery. The practice has an average of 30 deliveries per month, equating to 30 patients that need postpartum care monthly, however there is a significant number of patients that "no show" to their postpartum visits.

The patient population being served is primarily Caucasian with smaller percentage of African American and Hispanic/Latino patients. The median household income of the county in which the hospital resides is $44,551. The zip code in which the hospital resides, has the lowest median household income of $26,917 when compared to other zip codes within the county. The county has 11.3 percent of families living in poverty. Education in the hospital's county demonstrates a high school graduation rate of 77.6 percent, however Bachelor's Degree attainment is 8% lower than the state average. Furthermore, the zip code in which the hospital resides has the lowest high school degree attainment within the county, the highest unemployment rates, the highest number of households without a vehicle, and the greatest socioeconomic need (Healthy Communities Institute, 2015).

The office was recently remodeled, increasing the number of exam rooms available. This helped facilitate change by increasing space, allowing for more appointment times. Due to the recent coronavirus pandemic, much has been learned about telemedicine and billing practices, as

well as insurance coverage for telemedicine. The office continues to use telemedicine as needed for prenatal and gynecologic visits.

The current office policy for postpartum care differs slightly for vaginal delivery versus cesarean delivery. If a patient delivers vaginally, the patient is scheduled for one single postpartum visit in the office at five to six weeks post-delivery. If a patient delivers by cesarean section, the patient is scheduled for a nurse visit at 10 to 14 days post-operatively for an incision check. The patient is then scheduled for a postpartum appointment in the office at five to six weeks post-delivery. As stated previously, WHO guidelines for postpartum care include seeing women at three days post-delivery, 1-2 weeks and 6 weeks after birth (World Health Organization, 2013) and ACOG has revised its guidelines to include an initial assessment within the first 3 weeks postpartum and conclude with a comprehensive well-woman visit no later than 12 weeks after delivery. The current practice regarding postpartum care in the office, does not reflect the recommended guidelines.

In summary, the organizational assessment identified strengths and challenges. Based on the organizational need's assessment, this practice was a suitable, and appropriate environment in which to implement the DNP project.

PICOT Clinical Question

The PICOT acronym stands for patient population, intervention, comparison, outcome, and time frame (Echevarria & Walker, 2014). It aids in the formation of a clinical question that will guide the literature review. The PICOT question for this Doctor of Nursing Practice scholarly project is as follows: In women who have had a vaginal or cesarean delivery, how does the addition of anticipatory guidance at hospital discharge and three postpartum touchpoints (1-

week, 3-week, and 6-week) compared to the usual six-week postpartum visit alone impact postnatal depression disorders?

Definition of Terms

The key variables involved in this scholarly project include postpartum depression and breastfeeding continuation rates.

Population: patients delivering vaginally or by cesarean section will be included. The population will include all ethnicities and races. Women under the age of 18 will be excluded.

Postpartum depression: a mood disorder that can affect women after childbirth. Mothers experience feelings of extreme sadness, anxiety and fatigue, making it difficult to care for themselves or others, as well as carry out daily tasks (National Institute of Mental Health, n.d.). Postpartum depression is operationally defined by the Edinburgh Postnatal Depression Scale (EPDS) completed at 1 week, 3 weeks and 6 weeks postpartum. The EPDS is a current part of the office practice, administered at 6 weeks postpartum, and is currently embedded into the electronic medical record (EMR).

Breastfeeding continuation rates: defined as mothers who continued to exclusively breastfeed or breast and bottle feed. Any amount of breastfeeding qualifies as breastfeeding continuation. Breastfeeding continuation rates will be operationally defined by the patients' self-report of breast, bottle or combination breast and bottle feeding at 1 week, 3 weeks, and 6 weeks postpartum.

Combination feeding: defined as a combination of breast and bottle feeding.

Independent variable: the addition of anticipatory guidance and touchpoints in the postpartum period.

Time: Six weeks postpartum. The six-week timeframe was selected, and is reasonable, because most healthcare insurance companies cover pregnancy related care throughout the pregnancy and up to six weeks post-delivery.

Evidence-Based Practice Model of Implementation

The evidence-based practice model that was used to guide this scholarly project was the Iowa Model of Evidence-Based Practice. The Iowa Model is widely used to implement evidence-based practice in the clinical setting. The first question asks for the clinician to identify triggering issues or opportunities. These issues or opportunities can include clinical or patient identified issues, organizational, state or national initiatives, data or new evidence, accrediting agency requirements or regulations, and philosophies of care. The next step is to state the question or purpose of the evidence-based practice project, enabling a more focused approach.

The first decision point arrives. Is this topic a priority? If the topic is not aligned with the organization's mission or vision, it is unlikely to obtain resources to bring it to fruition. If the topic is of high priority, the next step would be to form a team and then assemble, appraise and synthesize the body of evidence. Decision point two arrives. Is there sufficient evidence? If not, then the recommendation is to conduct research. If yes, then the next step would be to design and pilot the practice change. The third decision point follows the pilot study. Is the practice change appropriate for adoption? If not, consider alternatives and redesign. If yes, then integrate and sustain the practice change. The last step would be to disseminate the results (Iowa Model Collaborative, 2017).

The Iowa Model is intended for use by novice to expert point of care clinicians and its usefulness has been demonstrated in a variety of settings. In this scholarly project, the Iowa model was used in an OB/GYN office setting. The Iowa Model is application oriented and a

step-by-step guide for the evidence-based practice process. The first step of the process has been completed. An opportunity for improvement has been identified. Postpartum care is not adhering to current practice guidelines and there are recommendations for increasing the amount of postpartum care provided in the United States. In addition, postpartum depression is a problem that leads to morbidity/mortality if left untreated. The purpose or question has been stated: in addition to the standard six-week postpartum visit does adding anticipatory guidance at hospital discharge, a one-week postpartum visit in the office and a three-week postpartum visit in the office or virtually for women who have had vaginal or cesarean deliveries affect postpartum depression compared to the standard six-week postpartum visit alone? Finally, is the topic a priority? Yes, it is. ACOG has made recommendations to increase the frequency of postpartum care. It is imperative that providers follow the guidelines of their governing bodies and provide the best evidence-based care to their patients (Iowa Model Collaborative, 2017).

Theoretical Framework

Ramona Mercer's midrange nursing theory, Maternal Role Attainment, was utilized as a theoretical framework. Maternal Role Attainment is a process that occurs over a period of time, where the mother becomes attached to her infant and develops competence in care-taking tasks, as well as expressing pleasure and gratification in the role (Mercer, 2004). Social support, the amount of help received in the first year postpartum, the patient's satisfaction with the help received and the network of persons providing that help, is a major concept within the Maternal Role Attainment Theory. Mercer describes four areas of social support including: emotional, informational, physical, and appraisal. Emotional support is the feeling of being loved, understood and cared for. Informational support is the provision of information that will help the mother help herself in dealing with a problem or situation. Physical support is helping the mother

directly. Finally, appraisal is a kind of support which tells the mother how she is performing in the role. According to Mercer, the process of becoming a mother or Maternal Role Attainment, is influenced by social support, stress, family functioning, and the relationship between the mother and father or significant others. Anxiety and depression are major concepts that can influence the ability to achieve the maternal role identity (Mercer, 2004).

Conclusion

Postpartum care is an important aspect of decreasing the morbidity and mortality rates related to pregnancy. It is imperative that healthcare providers begin to have more contact with mothers in the postpartum period in order to provide emotional, informational and physical support. Providing these additional touchpoints during the postpartum period may decrease the incidence of postpartum depression and anxiety, while increasing mother-infant bonding and breastfeeding continuation rates.

Chapter II: Review of the Literature

This chapter discusses the literature review process in detail. The critique and synthesis of previous evidence regarding postpartum care is articulated. Finally, the rationale for the DNP project is reviewed.

Introduction to Search Criteria

A comprehensive review of the literature was completed. The purpose was to find all relevant and up to date articles published that related to the impact of additional office visits or telephone calls to patients during the postpartum period, and its effect on postpartum depression. In addition, articles were found that related to the impact of additional postpartum visits on breastfeeding.

Databases employed were MedLine, Cumulative Index to Nursing and Allied Health Literature (CINAHL), and PsychInfo. The databases utilized were chosen because of the relation to health care and psychology. Search terms included depression, Edinburgh Postnatal Depression Scale, postnatal care, postpartum depression, breastfeeding, telehealth, and telemedicine. Boolean operators were used to combine search terms. Search combinations included: depression AND Edinburgh Postnatal Depression Scale, postnatal care AND postpartum depression, postnatal care, AND breastfeeding, and breastfeeding AND postpartum depression. Articles critiqued for the literature review were from all the above combinations of searches, as well as from handsearching reference lists of articles previously critiqued.

Inclusion criteria for articles were those from primary sources, meta-analyses, or systematic reviews, were written in English, and had full text available. Exclusion criteria included articles unrelated to the PICOT question, studies performed outside of high resource

countries, and initially excluded articles published greater than five years previously. After the initial review of the literature, the search was later expanded to include articles published prior to 2015 in order to capture articles relating to the validity and reliability of screening tools to be used within the project. The researcher's literature search produced 14 articles which were retained for detailed appraisal and leveling.

Literature was appraised using the Let Evidence Guide Every New Decision Model (LEGEND) (Cincinnati Children's Hospital Medical Center, 2019). LEGEND appraises individual articles based on their level of evidence from one to five. One being a meta-analysis or systematic review to five being guidelines, case-reports, local consensus, or published expert opinion (Cincinnati Children's Hospital Medical Center, 2019). Articles are also given a letter value of **a** if the study is of good quality and **b** if the article is a lesser quality study. The body of literature is then graded high, moderate, low, or very low depending on the number of studies, quality of studies, and consistency of results (Cincinnati Children's Hospital Medical Center, 2019).

After appraisal it was found that there were seven level 4a (Dennis, 2004; Goulet et al., 2008; McCabe-Beane et al., 2016; Navarro et al, 2007; Posmontier et al., 2016; Slomian et al., 2017; Wouk et al., 2016), two level 4b (Austin et al., 2010; Tully et al., 2017), one level 3a (Wisner et al., 2013), two level 2a (Howell et al., 2012; Labarere et al., 2005), and one level 1a study (Hadfield & Wittkowski, 2017). The overall body of evidence according to LEGEND was moderate (Cincinnati Children's Hospital Medical Center, 2019).

Critique and Synthesis of Previous Evidence

The 13 articles demonstrated a significant amount of research addressing the importance of care during the postpartum period and its effect on maternal health and breastfeeding. Five

studies examined the Edinburgh Postnatal Depression Scale and its effectiveness for screening for postpartum depression and anxiety (Austin et al., 2009; Dennis, 2004; McCabe-Beane et al., 2016; Navarro et al, 2007; Wisner et al., 2013). Two studies explored what mothers and families need most during the postpartum period (Slomian et al., 2017; Tully et al., 2017). Four studies addressed the type and timing of postpartum care and its effect on maternal mental health and/or breastfeeding outcomes (Goulet et al., 2007; Howell et al., 2012; Labarere et al., 2005; Posmontier et al., 2016). One study examined the association between postpartum depression and breastfeeding (Wouk et al, 2017). One article was a synthesis of qualitative research exploring women's experiences of psychological and psychosocial support for postpartum depression (Hadfield & Wittkowski, 2017).

Needs of Mothers and Families in the Postpartum Period

A qualitative study performed by Slomian et al. (2017) in Belgium explored the needs of mothers in the year following childbirth, to compare these needs between mothers who did not have the feeling of living with a psychological disorder or depression versus mothers who did live with a psychological disorder or depression. The sample size included 22 women, ten of them being mothers for the first time, ten of them for the second time and two of them for the third time. Similar needs were experienced by all women, but at different levels of intensity. Mothers' needs were separated into four categories: need for information, need for psychological support, need to share experiences, and need for practical and material support (Slomian et al., 2017). Strengths of this study included: two independent researchers analyzed results, topic saturation was achieved, interviews and focus groups were audio recorded and transcribed. Limitations of the study included: small sample in fathers' focus group, limiting the representativeness of the results of the focus group, and peer debriefer and member checking

were not utilized. The LEGEND score of this research study is 4a.

Another qualitative study completed by Tully et al. (2017) investigated what families need most in the first year postpartum. The sample size included 87 individuals: 18 new mothers residing in North Carolina and additional participants included nurses, physicians, health department staff, researchers, clinic directors, breastfeeding coordinators, and Women, Infant and Children (WIC) leaders. Four major topics emerged: 1) the intense focus on women's health prenatally is unbalanced by infrequent and late postpartum care, 2) medical practice guidelines often do not align with women's experiences and constraints, 3) validation of women as experts of their infants and elevating their strengths as mothers is necessary to achieve health goals, and 4) mothers need comprehensive care (Tully et al., 2017). A strength of this research design was that participants included multiple different stakeholders and mothers. The diversity of the sample was another strength identified. Limitations included: no mention of whether saturation was achieved, the article did not state if interviews/webinars/meetings were recorded, members were checked, or had more than one reviewer. This research study's LEGEND score is 4b.

These two articles reveal that all women experience similar feelings in the postpartum period, with the need for information and support being of great importance. Overall, the theme was that mothers need comprehensive care. The body of evidence for this sub-section was graded as very low because studies were qualitative, of lower quality with validity threats.

Impact of Type and Timing of Postnatal Care on Depression, Anxiety, and Breastfeeding

A meta-synthesis performed by Hadfield and Wittkowski (2017), synthesized qualitative research exploring women's experiences of professional psychological and psychosocial support for postpartum depression. Seventeen studies were included in the meta-synthesis which comprised the views of 585 women from the United Kingdom, Canada, Japan, and Australia.

Four themes were developed: 1) the process of seeking help, 2) the barrier to seeking and accepting support, 3) valued aspects of support, and 4) outcomes. Views about healthcare, knowledge, views about postpartum depression, and negative views of the self with postpartum depression impeded the process of seeking and accepting help. Once women in the study received help, the support was valued and perceived as contributory to change. The relationship with their healthcare professional was a valued aspect of support, as well as having their experiences validated in a confidential, nonjudgmental environment, which assisted with the development of coping strategies, as well as learning more about postpartum depression and parenting (Hadfield & Wittkowski, 2017). Strengths of this meta-synthesis included: studies from different countries and cultures, most studies were of very good methodologic quality, and multiple databases were used in the search strategy. Limitations of the meta-synthesis were that studies included were limited to those written in English, the review did not capture experiences unique to specific types of therapy, and only two of the 17 studies included referred to reflexivity, the process by which the researcher reflects upon the data collection and interpretation process. The LEGEND score of this meta-synthesis was 1a.

A study performed by Posmontier et al. (2016) tested the feasibility, effectiveness, and acceptability of interpersonal psychotherapy (IPT) administered by certified nurse-midwives via telephone as a treatment for postpartum depression. The population included women between six weeks and six months postpartum, aged 16 years and older, who were English speaking and had access to a telephone, had an EPDS score higher than nine, and met criteria for major depression on the MINI International Neuropsychiatric Interview. The intervention group consisted of women who were administered IPT therapy by telephone for eight sessions lasting 50 minutes each, for a maximum period of 12 weeks. Women in the comparison group were offered usual

treatment consisting of referral to a variety of mental health professionals who provided various psychotherapeutic modalities such as supportive and psychodynamic psychotherapy. Results revealed that there was a statistically significant difference between women in the treatment group and women in the control group on the mean score of the Hamilton Rating Scale for Depression after eight and 12 weeks of enrolling in the study (p = .47 at eight weeks and p = .29 at 12 weeks) in favor of women in the intervention group. The adjusted mean score on the Hamilton Rating Scale for Depression for women in the control group was 12.30 and 12.43 at eight weeks and 12 weeks respectively, while the adjusted mean score on the Hamilton Rating Scale for Depression score for women in the treatment group was 7.92 and 7.49 at weeks eight and 12 respectively. While there was no significant difference in EPDS scores between the two treatment groups, there was a significant reduction in the Edinburgh Postnatal Depression scores over time (Posmontier et al., 2016). Strengths of the research study included: 80% power being obtained, and all sessions were audio-recorded so the IPT supervisors could evaluate the CNM-IPT counselor fidelity and adherence to protocol. Limitations included: the small sample size, lack of randomization, the study may have been underpowered to detect small and moderate effects for social support and mother-infant bonding, and the research assistant was not blinded to treatment conditions that could influence measurement. This research study's LEGEND score is 4a.

Goulet et al. (2007) conducted a study in Quebec, Canada examining what constitutes adequate postnatal follow-up after hospital discharge. The sample included 2,583 mothers who delivered vaginally without complications at 36 weeks gestation or greater with a single live newborn and were discharged at less than 60 hours after birth. Women who were followed by midwives were excluded due to their number being too small. Telephone interviews were

conducted regarding postpartum hospital length of stay, mothers' mental health, breastfeeding, newborns' health, post discharge follow-up services and maternal assessment of services. Goulet et al. (2007) found that mothers who were in touch with a health professional soon after discharge, whether by telephone call, nurse's home visit, or appointment with a physician, were less likely to show moderate or severe depressive symptoms at one month postpartum. Mothers with more and earlier postpartum contact were 60% less likely to show depressive symptom. However, Goulet et al. (2007) also found that neither the type nor the timing of the follow-up services were associated with breastfeeding continuation up to one month postpartum. Conversely, mothers who showed signs of moderate to severe depression at one month postpartum were 50% less likely to continue to breastfeed. This study had many strengths. A survey firm conducted the telephone interviews. Mothers received a letter of information during their hospital stay which presented the objectives and methods of the study, including stating that they were free not to participate in the study either by contacting the research team or by refusing to be interviewed if they receive a call from the survey firm. Potential confounders were identified with univariate logistic regression analysis, then multivariate logistic analysis. A p value of ≤ 0.05 was used to determine significance. The study had a large sample size of 2,583 mothers and was conducted in both urban and rural settings. The study also had a few limitations. Selection bias was possible with a response rate of 72%. Recall bias could not be excluded since information was collected retrospectively. The results cannot be generalized to mothers who do not speak English or French, who delivered by cesarean section, or who were followed by midwives, since these women were excluded from the study. The survey was also conducted three years apart in Montreal, Canada and in the four other regions. This research study's LEGEND score was 4a.

Howell et al. (2012) examined the effectiveness of a behavioral education intervention on reducing postpartum depressive symptoms. The sample included 540 self-identified black and Latina postpartum mothers at a large tertiary inner-city hospital located in East Harlem in New York City. Mothers either received enhanced usual care or a behavioral educational intervention. Enhanced usual care included postpartum hospital education and a 2-week post-delivery call to inform them of future surveys and a list of health-related and community resources. The behavioral educational intervention included a 15-minute in-hospital review of patient education pamphlet and partner summary sheet and a 2-week-postdelivery phone call in which a social worker assessed patients' symptoms, skills in symptom management and other needs. The intention-to-treat analysis (N = 540) showed that mothers in the intervention group were less likely to screen positive for depression than mothers in the control group: at 3 weeks, 8.8% (20 of 227) compared with 15.3% (37 of 242; $p = .03$), respectively; at 3 months, 8.4% (20 of 237) compared with 13.2% (32 of 242; $p = .09$), respectively; and at 6 months, 8.9% (19 of 214) compared with 13.7% (29 of 211; $p = .11$), respectively. Repeated-measure analysis revealed that mothers who experienced the intervention were 67% less likely to screen positive for depressive symptoms for up to 6 months of follow-up. (Howell et al., 2012). Results indicated that a behaviorally focused educational intervention in the postpartum period has the potential to reduce the likelihood of a positive depression screen (Howell et al., 2012). Strengths of this study include appropriate power obtained with the 540-sample size with 90% power, randomization was performed, interviewers were blinded to study arm assignment, attrition rate was low and equivalent across treatment groups, and intention-to-treat analysis was used. Limitations of this study included: the study was only implemented in one institution, which limits generalizability, the rate of positive depressive symptom screens was much lower than rates in previously

published literature on women of color, and a depression screening tool was used rather than a formal structured interview to diagnose depression. The LEGEND score for this research study was 2a.

Another study aimed to ascertain whether attending an early postpartum outpatient visit delivered in a primary care office would improve breastfeeding outcomes (Labarere et al., 2005). The sample included 231 mothers who had delivered a healthy newborn at 37 weeks gestation or greater and were breastfeeding on the day of discharge. The study took place at a level three maternity facility in France. The control group had post-discharge follow-up in a primary care physician's office at one, two, three, four, five, and six months postpartum. The intervention group received post-discharge follow-up within two weeks after the birth and were seen by a provider that had received five hours of breastfeeding education. The rate of exclusive breastfeeding at four weeks of infant age was significantly higher in the intervention group than in the control group. In the multivariate analysis, the association between the intervention and exclusive breastfeeding at four weeks remained two and a half times higher than in the control group after adjustment for potential confounding factors (Labarere et al., 2005). The median breastfeeding duration was higher in the intervention group, with the median duration being 18 weeks, than in the control group, which was 13 weeks. The mothers in the intervention group were also less likely to report any difficulties with breast-feeding. Findings demonstrated that compared with usual care, the attendance of a routine outpatient visit two weeks after birth is associated with a significant increase in the rate of exclusive breastfeeding at four weeks of age and longer median breastfeeding duration (Labarere et al., 2005). Strengths of this study included: randomization generated by the statistical adviser of the study and randomization assignments that were unknown to any of the investigators, 85% power was reached with a two-

tailed alpha error of < .05, there was low attrition rates, and intention-to-treat analysis was used. There were a few limitations of this research study as well. Physicians were self-selected and therefore most likely motivated, which could have contributed to the improvements in breastfeeding outcomes in the intervention group. It was not possible to blind observers. Breastfeeding duration was assessed retrospectively at 26 weeks, which could lead to recall bias. The study was conducted in a single setting and focused on socioeconomically low-risk population living in a medium-sized city, limiting the applicability of results to other settings or health care facilities. This research study's LEGEND score is 2a.

These four studies synthesized together reveal that women generally value increased postpartum support, whether it be in person or by telephone or virtually. Additional postpartum support soon after hospital discharge does appear to decrease moderate or severe depressive symptoms and may improve breastfeeding outcomes. The overall body of evidence for this subsection was graded as high.

Postpartum Mood Disorders and Breastfeeding

A study performed by Wouk et al. (2017) examined the association between postpartum depression, anxiety and breastfeeding. This study used a national, stratified, random sample of mothers from the United States to evaluate the extent to which depression and anxiety affect breastfeeding odds. The 2010-2011 Pregnancy Risk Assessment Monitoring System (PRAMS) was used to conduct a secondary analysis regarding maternal attitudes and health behaviors before, during, and after pregnancy. Questionnaires were administered two to four months postpartum. Twenty-nine states and New York City met the response rate threshold of 65% and were included in the analysis. Approximately 36.9% of women with PPD symptoms were breast and bottle feeding at three months postpartum, while 51.0% of women without PPD symptoms

were breast and bottle feeding at three months postpartum. Women exclusively breastfeeding at three months postpartum approximated at 18.3% for women experiencing symptoms of PPD, while 28.1% of women without PPD symptoms were exclusively breastfeeding at three months postpartum. When pre-pregnancy mental health visits, prenatal morbidity, pregnancy intention, and stressful events in the 12 months before birth were adjusted for, women with PPD symptoms were found to be 79% less likely to be breastfeeding of any type at three months postpartum (Wouk et al., 2016). For women with and without postpartum anxiety, 42.4% versus 53.4% of women, respectively, were doing any type of breastfeeding at three months postpartum, and 15.5% versus 26.1% were breastfeeding exclusively at three months. After adjustment, women reporting postpartum anxiety symptoms were 87% less likely to be breastfeeding of any type at three months postpartum, and 92% less likely to be exclusively breastfeeding at three months postpartum compared with women without symptoms (Wouk et al, 2016). Strengths of this study included: the number of participants in a national data set weighted to be representative of postpartum mothers, the smallest sample size being 44,294 women and the largest being 74,429 women, the size and diversity of the 29 states and New York City included in the survey make the results broadly generalizable to mothers in the United States, and potential confounders were largely able to be controlled due to the survey providing data on a variety of demographic and clinical variables. Limitations of the study included: data collection was cross-sectional, possible reverse causation due to women reported both depression and anxiety symptoms and breastfeeding practices at the same time, data were not available on pregnancy depression, which has been shown to predict PPD and shorten breastfeeding duration, and possible reporting bias due to mothers underreporting depression symptoms. This study's LEGEND score is 4a.

Edinburgh Postnatal Depression Scale

McCabe-Beane et al. (2016) aimed to establish severity cut-off scores for the EPDS based on a widely used depression symptom severity measure, the Beck Depression Inventory (BDI). The study utilized data collected as a part of a larger project, which used a convenience sample from four counties in Iowa and from women receiving services from maternal and child health centers in Iowa and Michigan. The sample included 1516 women. Women completed both the EPDS and BDI questionnaires. Women, on average, were 22 weeks postpartum when they completed the questionnaires. This study used 'linking', broadly referring to statistical transformations that make scores on one test comparable to scores on another test, through scale-alignment approaches to develop concordance between the EPDS and BDI. The Pearson correlation between the EPDS and the BDI was .81, which suggested that these questionnaires were assessing similar constructs. Among the participants sampled, the average score on the EPDS was 7.0 (SD = 5.2, range 0-25) and 10.3 (SD = 7.7, range 0-46) on the BDI. Through linking EPDS scores with BDI scores, a score of 10 on the BDI is equated to a score of 7 on the EPDS because approximately the same percentage of women scored at or below these numbers (59.3% and 59.2%, respectively). These results suggest that none or minimal depression on the BDI corresponds to scores of 0-6 on the EPDS. Mild depression on the BDI corresponds to scores of 7-13 on the EPDS. Moderate depression on the BDI corresponds to scores of 14-19 on the EPDS and severe depression on the BDI corresponds to scores of 19-30 on the EPDS. Ninety-five percent confidence intervals were calculated for EPDS percentiles that represented lower cut-offs of the severity levels, 7 for mild, 14 for moderate and 19 for severe. Strengths of the study included the large sample size, and the mean depression scores were slightly higher than those reported in other studies, which allowed for a greater range of severity on the EPDS and BDI. Weaknesses of the study included the fact that few women scored in the severe range

of depression, making it impossible to establish score equivalencies for the extreme EPDs scores greater than 25, and the fact that while the BDI has been validated for use in postpartum women, the BDI severity ranges have not. This study's LEGEND score is 4a

Dennis (2002) examined whether the EPDS can be used in the immediate postpartum period to predict postpartum depression so that preventative interventions can be implemented. A population-based sample of 594 women participated in the study. Mothers completed the EPDS at one week, four weeks, and eight weeks postpartum. At one week postpartum, 29.5% of mothers scored greater than nine on the EPDS. The number of mothers scoring greater than nine decreased to 23% at 4 weeks postpartum and decreased further to 20.5% at eight weeks postpartum. The one-week EPDS was significantly correlated to the four-week ($r = 0.72$, $p <$ .001) and eight-week ($r – 0.65$, $p = <$ .001) EPDS. Mothers who scored greater than nine on the EPDS at one week postpartum were 30.3 times more likely at four weeks (95% CI = 17.5-42.3) and 19.1 times more likely at eight weeks (95% CI = 11.0-32.9) to experience postpartum depression symptoms. Limitations of the study included low numbers of ethnic minorities and single mothers and no psychiatric interviews were conducted. This study's LEGEND score is 4a.

Wisner et al. (2013) aimed to screen for depression in postpartum women utilizing the EPDS to determine the value of screening for postpartum depression. This study was a sequential case series of postpartum women in an urban academic women's hospital. Women were screened with the EPDS at four to six weeks postpartum by telephone. Women who screened positive were then invited to undergo psychiatric evaluation in their home. A cut-off score of ten on the EPDS was used to determine a positive screen. Ten thousand women completed the four-to-six-week EPDS screening, with 1396 women receiving a positive screen. A telephone diagnostic interview was completed by 826 women. All women who had the highest level of thoughts of

self-harm scored above the EPDS cut-off score of ten or higher. Women with positive EPDS screens were diagnosed with the following psychiatric disorders using the Structured Clinical Interview for DSM-IV for Axis 1 diagnoses (SCID): unipolar depression (68.5%), bipolar disorder (22.6%), no primary axis 1 diagnosis (2.1%). Almost two-thirds of women with major depressive disorder also had an anxiety disorder, such as generalized anxiety disorder. Strengths of the study included the sample size, the largest study ever in the United States using screening with the EPDS. A limitation of the study was that a significant number of women (30%) did not receive post-screening diagnostic evaluation. The findings of this study indicate that the EPDS could be used to screen during pregnancy, as early as one week postpartum, and at four-to-six weeks postpartum. Finally, a cutoff score identifies those women with the most intense self-harm ideation. This study's LEGEND score is 3a.

These three research studies combine to reveal that the EPDS identifies women at risk for depression and self-harm ideation and can be used early and throughout the postpartum period. Using the EPDS early in the postpartum period can be predictive of postpartum depression in the later postpartum period. Finally, the EPDS severity ranges can be used to classify severity of depressive symptoms and guide treatment decisions. The overall body of evidence for this subsection is graded as low

Rationale for Project

The intense focus on women's health during pregnancy is unbalanced by infrequent and late postpartum care (Tully et al., 2017). After completing the literature review, it was evident that there is a significant amount of research describing the importance of postpartum care and its effect on maternal mood disorders, such as postpartum depression and anxiety. Research evidence confirms that mothers who were in touch with health professionals soon after

discharge, whether by telephone call, home visit, or in office appointment, were 60% less likely to show moderate or severe depressive symptoms at one month postpartum (Goulet et al., 2007). The literature review demonstrated that the addition of early postpartum visits, telephone calls, or virtual visits can affect postpartum depression and/or anxiety, as well as breastfeeding. Having this data allows providers to properly evaluate their postpartum care schedule and provide patients with optimized postpartum care.

The fourth trimester, or postpartum period, is a largely neglected aspect of women's health care. This project addresses this practice gap and affords women the attention they deserve during the postpartum period. Given that more than half of pregnancy-related deaths occur after the birth of the infant, with substantial morbidity occurring in the early postpartum period, increasing the number of visits and amount of time spent with patients during the postpartum period may improve patient outcomes, decreasing morbidity and mortality in the fourth trimester (Langan et al., 2016). In addition, depression during or immediately after pregnancy is a common medical complication affecting one in seven women and is associated with significant neonatal and maternal morbidity (Langan et al., 2016). Finally, the addition of earlier postpartum patient touchpoints brings the practice setting into compliance with the ACOG recommendation for optimized postpartum care. The office will now be practicing to the standards of care. This project directly addresses the impact of increased postpartum care on postpartum depression. The more time that providers can spend with patients, providing support and education, during this critical time period, the more likely that depression and anxiety can be addressed at an early stage.

Chapter III: Methods

The following chapter discusses the DNP project in detail. The project type and design are reviewed. The population is discussed, followed by the outcome measures. Finally, the data analysis plan is reviewed, and the data management is examined and discussed.

Project Type and Design

The project type of this DNP project was translating evidence into practice. According to Moran et al., (2020), the focus of implementing evidence into practice is identifying and applying best-practice approaches to health care with the final goal of improving patient outcomes. There exists a gap between research evidence and current practice related to postpartum visits at the project site. The goal was to bridge this gap. ACOG guidelines exist for optimizing postpartum care. The project design was comparative, pre- and post- (retrospective and prospective). Retrospective chart review was used to obtain information regarding Edinburgh Postnatal Depression Scale (EPDS) scores and breastfeeding continuation rates, while a prospective design was used to collect the after implementation of evidence-based practice data (Moran, 2020). Repeated measures were also used with EPDS scores.

Primary and Secondary Aims

This DNP project's aim was to implement optimized postpartum care and measure outcomes, such as postpartum depression, as well as breastfeeding continuation rates, to evaluate if these outcomes were improved by implementing evidence-based practice.

The project's primary aim was to compare postpartum depression rates in women who received usual postpartum care with a six-week postpartum visit only (the pre group) with women who received optimized postpartum care with the addition of a one week visit in the

office and a three-week virtual or in office visit if needed (the post group). There are three secondary aims of the project. These aims are to: (1) compare breastfeeding continuation rates before and after the practice change; (2) compare breastfeeding rates with postpartum depression symptoms; and (3) compare demographic characteristics such as parity, maternal age, marital status, race with EPDS scores.

Population

The population included in the project were women who were active obstetrical patients at the project site and had delivered vaginally or by cesarean section. The usual postpartum care groups (pre-group) included women who delivered vaginally or by cesarean section during the time frame of April through July 2020 and April through July 2019. It was anticipated that the corona virus pandemic, which began in March 2020, may potentially affect the outcomes in the pre-group April through July 2020 (AJMC Staff, 2021). Due to this potential impact, a second pre-group of April through July 2019 was utilized. The *after-practice* change group took place from April through July 2021. Inclusion criteria: women 18 years or older who have experienced vaginal delivery, cesarean delivery, vaginal birth after cesarean delivery, or vacuum assisted vaginal delivery. Exclusion criteria: women who did not show for their postpartum appointments. Using G*Power, the minimum sample size required for Analysis of Variance (ANOVA) with three groups is 159, or 53 per group, to achieve a power of 0.80 with an alpha of .05 and medium effect size. However, the minimum sample size for repeated measures ANOVA among the practice change group is 73. Therefore, a minimum of 53 records from 2019 and 53 from 2020 needed to be included in the sample. For the after-practice change group, the goal was to recruit a minimum of 73 patients.

Measurement Tools

One tool was used during the implementation of this project. The Edinburgh Postnatal Depression Scale (EPDS) was used to screen for postpartum depression. The EPDS is reviewed in the following section. The reliability and validity of the EPDS is also discussed.

Edinburgh Postnatal Depression Scale

The EPDS is a ten-item questionnaire that was developed in the United Kingdom, in 1987 with the purpose of screening postpartum women for symptoms of depression or anxiety (Shrestha et al., 2016). The EPDS assesses the mother's emotional experiences over the past seven days with ten Likert-scale questions. The test can be completed in approximately five minutes (Shrestha et al., 2016). The EPDS was already being used in the office at the postpartum visit for the assessment of postpartum depression. The scale was embedded into the electronic medical record (EMR). No permission was required to use this tool. The EPDS was administered at the one-week, three-week and six-week visits at project implementation.

The EPDS has well-established estimates of sensitivity and specificity. Combined sensitivity and specificity were maximized when a cut-off value of 11 or higher was used, with a sensitivity of 81% and specificity of 88% (Levis et al., 2020). The EPDS exhibits excellent validity. The EPDS optimal cut-off score was 9/10, with 85.5% sensitivity (95% CI = 79.5 - 90.3), and 85.3% specificity (95% CI = 80.1 - 89.7). The EPDS has been validated against a full range of DSM-IV diagnoses with encouraging results (Navarro et al., 2007).

Procedures

A Gantt chart was created to facilitate a timeline. The Institutional Review Board (IRB) application was submitted and approved prior to project implementation. Staff education occurred during staff meetings to facilitate proper scheduling of postpartum appointments. Data collection took place over a 25-week period.

Retrospective Chart Review

The principal investigator (PI) performed the chart review for the months of April through July 2019 and April through July 2020. A password protected EXCEL spreadsheet was used to document information from the chart review with no patient identifiers. Patients were tracked on the EXCEL spreadsheet via their delivery number from labor and delivery. EPDS scores and breastfeeding data were collected from the six-week postpartum visit. Demographic data including maternal age, race, insurance coverage, and marital status were also collected.

Implementation of Practice Change

The practice change to more frequent touchpoints began on April 1, 2021. Patients who delivered April through July 2021 were scheduled for a one-week follow-up appointment in the office after delivery and a 6-week comprehensive postpartum visit. Patients with an elevated EPDS score of eight or greater, patients with a history of postpartum depression, and patients with a history of depression, anxiety, or bipolar disorder all returned for an in office or virtual three-week postpartum visit. The one-week and six-week appointments were scheduled for the patient prior to discharge from the hospital after delivery. The front office staff called the labor and delivery unit after the patient delivered to notify the nurse caring for the patient of the patient's postpartum appointments. The nurse then gave the patient appointment cards with their appointment dates and times prior to hospital discharge. The increase in the number of postpartum visits was discussed with the patient during prenatal care prior to delivery by the provider.

The one-week postpartum visit included completion of the EPDS upon check-in to the office. The EPDS was administered via a computer tablet and transferred immediately to the EMR. The patient was then roomed by the medical assistant or nurse and vital signs were

obtained. The patient was then seen by the PI. The EPDS was reviewed and discussed with each patient. Things to expect postpartum were discussed and acute postpartum issues such as fatigue, pain, breastfeeding problems/questions, postpartum depression, anxiety, and urinary incontinence were addressed.

The three-week postpartum visit, if needed, was either a virtual or in office visit. The medical assistant or nurse administered the EPDS upon check in for a virtual visit. Patients who were seen in the office were administered the EPDS via the computer tablet. The patient was then be seen by the PI. The EPDS was reviewed and discussed. Postpartum expectations were reviewed, and any acute postpartum issues were discussed.

The six-week comprehensive postpartum visit took place in the office. The EPDS was administered upon check-in to the office via a computer tablet and transferred immediately to the EMR. The patient was roomed by the medical assistant or nurse and vital signs were obtained. The patient was then seen by one of the providers at the practice. The provider reviewed the EPDS with the patient. A full physical exam was performed. Postpartum expectations and acute issues were discussed. Finally, postpartum education was reviewed.

Protection of Subjects

The Institutional Review Board (IRB) application was submitted and approved prior to project implementation. Active obstetric patients are seen by all five providers within the practice. The principal investigator is one of the five providers at the practice site. Patients did not need to be recruited or consented as this was a generalized evidence-based practice change, therefore all patients were included in the addition of postpartum touchpoints. The primary investigator was granted permission by the project clinic site to conduct the project at the

practice site and have access to the EMR. The project clinical site has written a letter of support for this project.

Data Management

Data was collected both retrospectively and prospectively. Data was abstracted by the PI from the password protected EMR system. Data was entered into a Microsoft Excel spreadsheet. The project database did not contain any personally identifiable information, protecting patient confidentiality. Patient sociodemographic, clinical data, and project specific data were collected without any personally identifiable information. Only project-mandated data was utilized to answer the evidence-based practice questions. Data was extracted from the EMR and stored on a password protected computer. All births were logged by month and number. Cumulative data was reviewed weekly by the PI. Only the PI and statistician had access to the data. No data existed in hard copy. The data will be stored for three years.

Data Analysis Plan

A data analysis plan was completed with a statistician to meet the project objectives. The primary aim of the project, "evaluate postpartum depression rates in women with optimized postpartum care compared with usual postpartum care", was evaluated utilizing the EPDS. An independent samples t test was used to determine the difference between EPDS scores among the pre-practice change and post-practice change groups at six-weeks postpartum.

Secondary aim #1, compare breastfeeding continuation rates before and after the practice change, will be evaluated using the Chi-Square test. Secondary aim #2, compare breastfeeding rates with postpartum depression, will be evaluated using the ANOVA and Chi-Square test. The paired t-test will be used to examine the relationship between breastfeeding rates and postpartum depression scores. Secondary aim #3, compare demographic characteristics such as insurance

status, , marital status, delivery type, and race/ethnicity with EPDS scores will be evaluated using one-way ANOVA and independent samples t-tests.

Chapter IV: Results

Data collection and analysis were utilized to evaluate the outcomes' measures of the doctoral project. The four aims of the project were (1) to compare postpartum depression rates in women who received usual postpartum care via a six-week postpartum visit only (the pre group) with women who received optimized postpartum care with the addition of a one week visit in the office and a three-week virtual or in office visit if needed (the post group); (2) compare demographic characteristics such as insurance status, maternal age, marital status, and race with EPDS scores; (3) compare breastfeeding rates with postpartum depression symptoms; and (4) compare breastfeeding continuation rates before and after the practice change. The purpose of chapter four is to present the data and the analysis of the project through statistical methods. In keeping with the most scientific data analysis, the alpha value was set at 0.05. This means that there was a five percent chance of a type one error, rejecting the null hypothesis when it is true. The alpha value was not decreased to balance the risk of making a type-two error, accepting the null hypothesis when it is false.

Analysis of Data

Data was collected both retrospectively and prospectively. The principal investigator (PI) performed the chart review for the months of April through July 2019 and April through July 2020. EPDS scores and breastfeeding data were collected from the six-week postpartum visit. Demographic data including maternal age, race, insurance coverage, and marital status were also collected. EPDS and breastfeeding status were collected at each 1-week, 3-week, and 6-week postpartum visit after the addition of early postpartum visits. Data that was collected was sent to a statistician via an Excel file who imported the data into SPSS. Using G*Power, the minimum sample size required for Analysis of Variance (ANOVA) with three groups is 159, or 53 per

group, to achieve a power of 0.80 with an alpha of .05 and medium effect size. However, the minimum sample size for repeated measures ANOVA among the practice change group is 73. Therefore, the 87 patients from 2019, 98 from 2020, and 112 patients from after-practice change group, for a total of 297 patients was a large enough sample size to meet adequate power.

Characteristics of the Sample

The pre-group totaled 185 patients, with 87 patients delivered between April 1 and July 31, 2019, and 98 patients delivered between April 1 and July 31, 2020. The post implementation of practice change group included 112 patients delivered between April 1 and July 31, 2021.

Of the 297 total participants, 201 were single (67.7%), 93 were married (31.3%), and 3 (1.0%) participants were missing marital status. The majority of participants (76.1%) were Caucasian. African Americans comprised 13.1% of the participants, while Hispanics comprised 10.4% of the participants. Patients who participated in the project primarily had Medicaid insurance coverage (68.4%). Patients with commercial insurance comprised 29.3% of the participants and patients who were self-pay comprised 2.4% of the participants. Sixty-four percent of the participants delivered vaginally. Sixteen percent of patients delivered by primary cesarean section and sixteen percent delivered by repeat cesarean section. Four patients between the months of April and July in the years 2019, 2020, and 2021 delivered by vacuum assisted vaginal delivery. The average age of patients in the 2019 pre-group was 26.5, 27.1 in 2020 and 26.5 in 2021. The age range of women who delivered in the 2019 pre-group was 18-45, 18-42 in the 2020 pre-group, and 18-42 in the 2021 post-practice change group. Table 1 is a summary of the participant characteristics separated by year.

Table 1. Participant Characteristics

	2019 (*n* = 87) *n (%)*	2020 (*n* = 98) *n (%)*	2021 (*n* = 112) *n (%)*	Total (*n* = 297) *n (%)*
Marital Status				
Single	55 (63.2)	68 (69.4)	78 (69.6)	201 (67.7)
Married	30 (34.5)	29 (29.6)	34 (30.4)	93 (31.3)
Missing	2 (2.3)	1 (1.0)	0 (0.0)	3 (1.0)
Race				
African American	13 (14.9)	11 (11.2)	15 (13.4)	39 (13.1)
Caucasian	64 (73.6)	75 (76.5)	87 (77.7)	226 (76.1)
Hispanic	10 (11.5)	11 (11.2)	10 (8.9)	31 (10.4)
Missing	0 (0.0)	1 (1.0)	0 (0.0)	1 (0.3)
Insurance				
Medicaid	63 (72.14)	64 (65.3)	76 (67.9)	203 (68.4)
Commercial	22 (25.3)	31 (31.6)	34 (30.4)	87 (29.3)
Self-Pay	2 (2.3)	3 (3.1)	2 (1.8)	7 (2.4)
Delivery Type				
Standard Vaginal Delivery	60 (69.0)	52 (53.1)	78 (69.6)	190 (64.0)
Primary C-Section	11 (12.6)	23 (23.5)	14 (12.5)	48 (16.2)
Repeat C-Section	16 (18.4)	21 (21.4)	11 (9.8)	48 (16.2)
VAVD	0 (0.0)	1 (1.0)	3 (2.7)	4 (0.01)
Missing	0 (0.0)	1 (1.0)	6 (0.04)	7 (0.02)
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*
Age	26.5 (5.8)	27.1 (5.9)	26.5 (5.3)	26.7 (5.6)

Depression and Anxiety Symptoms

Every participant in the project was evaluated for a history of depression prior to delivery. Approximately 35% of the patient population in the 2019 pre-group and 33% of the 2020 pre-group had a history of depression prior to delivery. In 2021, the patient population with a history of depression prior to delivery increased to approximately 41%. The 2019 pre-group had 24.1% of patients receiving treatment for postpartum depression, with 18.4% initiating treatment and 5.7% continuing prior treatment with adjustments in medication or counseling. The 2020 pre-group was similar to 2019 with 23.4% of patients receiving treatment for

postpartum depression, 21.4% initiating treatment and 2.0% continuing prior treatment. The 2021 post-practice change group revealed 32.1% of patients received treatment for postpartum depression, with 23.2% initiating treatment and 8.9% continuing treatment initiated prior to delivery. Table 2 reports data on depression history, treatment for postpartum depression and type of treatment utilized.

Table 2. Depression and Treatment

	2019 (*n* = 87) *n (%)*	2020 (*n* = 98) *n (%)*	2021 (*n* = 112) *n (%)*	Total (*n* = 297) *n (%)*
History of Depression/Anxiety	30 (34.5)	32 (33.0)	43 (40.6)	105 (35.4)
Treatment for Postpartum Depression/Anxiety				
No	57 (65.5)	58 (59.2)	66 (58.9)	181 (60.9)
Yes, treated	16 (18.4)	21 (21.4)	26 (23.2)	63 (21.2)
Continuation of prior treatment	5 (5.7)	2 (2.0)	10 (8.9)	17 (5.7)
Missing	9 (10.3)	17 (17.3)	10 (8.9)	36 (12.1)
Type of Treatment	(*n* = 21)	(*n* = 23)	(*n* = 36)	(n = 80)
Medication	15 (71.4)	12 (52.2)	21 (58.3)	48 (60.0)
Medication & Counseling	5 (23.8)	9 (39.1)	10 (27.8)	24 (30.0)
Counseling	0 (0.0)	2 (8.7)	2 (7.7)	4 (5.0)
Medication dose increased	1 (4.8)	0 (0.0)	2 (7.7)	3 (3.8)
Missing	0 (0.0)	0 (0.0)	1 (2.8)	1 (1.3)

EPDS Scores Before and After Optimized Postpartum Care

The six-week EPDS scores for pre-groups 2019 and 2020 were combined and compared to the 2021 post-practice change group using the independent samples t test. Depression scores at six weeks were significantly higher in the 2019/2020 pre-group (M = 7.8, SD = 6.5) than in the 2021 post-practice change group (M = 6.2, SD = 5.7), $t(243) = 1.92$, $p = .028$. The mean

difference, standard deviation, *t* scores and *p*-value for the six-week EPDS scores are reported in Tables 3 and 4.

Table 3. Six-Week EPDS Scores

	Year	N	Mean	Std. Deviation	Std. Error Mean
EPDS Score 6-week	2021	88	6.17	5.732	.611
	2019/20	157	7.77	6.529	.521

Table 4. Six-Week EPDS Scores Independent Samples Test

		F	Sig	t	df	p	Mean Difference	Std. Error Difference	95% CI Lower	95% CI Upper
EPDS Score 6-week	Equal variances assumed	2.616	.107	-1.921	243	.028	-1.600	.833	-3.241	.041
	Equal variances not assumed			-1.993	200.43	.024	-1.600	.803	-3.184	-.017

EPDS scores were also evaluated by their severity range at the six-week postpartum visit. The 2019 and 2020 pre-group were combined and compared to the 2021 post-practice change group. The 2019/2020 pre-group had a greater percentage of patients in no depression range (54.1%) compared to the 2021 post-practice change group (37.5%). However, moderate and severe depression ranges were higher in the 2019/2020 group at 14.6% and 9.6% respectively, compared to the 2021 post-practice change group at 9.1% and 3.4% respectively. These results were not statistically significant with $X^2(3) = 4.80$, $p = .19$. Six-week EPDS severity ranges by year are displayed in Table 5.

Table 5. Six-Week EPDS Depression Severity Ranges

EPDS Severity Range	2019/2020	2021
	n (%)	*n (%)*
No depression (0-6)	85 (54.1)	51 (37.5)
Mild depression (7-13)	38 (24.2))	27 (30.7))
Moderate depression (14-19)	23 (14.6)	8 (9.1)
Severe depression (19-30)	15 (9.6)	3 (3.4)

$X^2(3) = 4.80$, $p = .19$.

Breastfeeding Continuation Rates

Infant feeding practices at birth and six-weeks postpartum are displayed in Table 6. The percentage of mothers breastfeeding at birth was 60.9% in the 2019 pre-group, 62.2% in the 2020 pre-group and 57.1% in the 2021 post-practice change group. The percentage of mothers breastfeeding at the six-week postpartum visit was 32.2% in the 2019 pre-group, 25.5% in the 2020 pre-group and 23.2% in the 2021 post-practice change group. When accounting for only those mothers who breastfed at birth, there was no difference in six-week breastfeeding rates between the 2019/2020 pre-groups (52.6%) and the 2021 post-practice change group (48.1%), as displayed in Table 7.

Table 6. Feeding Practices at Birth and Six Weeks

	2019 (*n* = 87) *n (%)*	2020 (*n* = 98) *n (%)*	2021 (*n* = 112) *n (%)*
Birth			
Bottle	25 (28.7)	21 (21.4)	27 (24.1)
Breast	53 (60.9)	61 (62.2)	64 (57.1)
Both breast and bottle	9 (10.3)	14 (14.3)	13 (11.6)
Missing	0 (0.0)	2 (2.0)	8 (7.1)
Six weeks			
Bottle	40 (46.0)	41 (41.8)	54 (48.2)
Breast	28 (32.2)	25 (25.5)	26 (23.2)
Both breast and bottle	8 (9.2)	14 (14.3)	9 (8.0)
Missing	11 (12.6)	18 (18.4)	23 (20.5)

Table 7. Mothers Breastfeeding at Birth

		2019/2020	2021	Total
Breast at 6-weeks postpartum	Bottle	46	28	74
	%	47.4%	51.9%	49.0%
	Breast	51	26	77
	%	52.6%	48.1%	51.0%

Breastfeeding and EPDS Scores

There was a total of 242 patients who delivered between April 1 and July 31 in 2019, 2020, and 2021 that were seen for a six-week postpartum visit. Of those 242 patients, 133 were bottle feeding, 78 were breast feeding, and 31 were both breast and bottle feeding at the six-week visit. Patients who were bottle feeding had an average EPDS score of 7.85 at the six-week visit, while patients who were both breast and bottle feeding had a slightly lower EPDS score of 6.71. Patients who were exclusively breastfeeding had the lowest average EPDS score of the three groups at 6.17. Type of infant feeding and average EPDS scores at the six-week postpartum visit are displayed in Table 8. The difference in average EPDS scores at the six-week postpartum visit and type of feeding was not statistically significant, $F(2, 239) = 1.88$, $p = .16$, as displayed in Table 9.

Table 8. Type of Feeding and Average EPDS Score at Six-Week Postpartum Visit

EPDS Score 6-week PP	N	Mean	Std. Deviation
Bottle	133	7.85	6.559
Breast	78	6.17	5.870
Both breast and bottle	31	6.71	5.751
Total	242	7.16	6.269

Table 9. Six-Week EPDS Scores and Type of Infant Feeding

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups (pre and post groups)	146.502	2	73.251	1.878	.155
Within Groups	9324.213	239	39.013		
Total	9470.715	241			

There was a significant difference for patients who were treated for postpartum depression and the type of infant feeding at the six-week postpartum visit. Patients who were breast feeding at the six-week postpartum visit were significantly less likely to be treated for postpartum depression (note that patients who were breast feeding at the six-week postpartum visit did have lower EPDS scores than both bottle and combination feeders). Approximately 38.2% of patients who were bottle feeding and 32.3% of patients who were combination feeding at six-weeks postpartum were treated for postpartum depression with either medication, counseling or a combination of medication and counseling. However, only 19.2% of patients who were breast feeding at the six-week postpartum visit were treated for postpartum depression, $X^2(2) = 8.35$, $p = .015$. See Table 10.

Table 10. Postpartum Depression Treatment and Type of Infant Feeding

		Feeding at Six-Week Visit			
		Bottle	Breast	Breast and Bottle	Total
Not Treated for PP Depression	Count	82	63	21	166
	% Feeding 6-week visit	61.7%	80.8%	67.7%	68.6%
Treated for PP Depression	Count	51	15	10	76
	% Feeding 6-week visit	38.3%	19.2%	32.3%	31.4%
Total	Count	133	78	31	242
	% Feeding 6-week visit	100.0%	100.0%	100.0%	100.0%

Demographic Groups and EPDS Scores

The average six-week EPDS score was significantly higher among those with Medicaid coverage (8.31) than those with commercial insurance (5.30), $p = < .001$. EPDS scores were also significantly higher in mothers who were single (8.06), than those who were married (5.51), $p = < .001$. However, there was a significant relationship between having Medicaid and marital status: 81.7% of single women were on Medicaid compared to only 3.87% of married women, chi square (df = 4) = 56.0, $p = < .001$. While there were differences in average six-week EPDS scores in African American mothers (8.73) versus Caucasian mothers (7.17) versus Hispanic mothers (5.39), these differences were not statistically significant $p = .16$. The average six-week EPDS scores for delivery type were also examined. The average six-week EPDS score for mothers who delivered by cesarean section (8.22) was higher than those mothers who delivered vaginally (5.51), although not statistically significant $p = .067$. Table 11 displays results for six-week EPDS scores by demographic groups, including mean score, standard deviation, p value and effect size.

Table 11. Six-Week EPDS Score by Demographic Groups

	M	SD	Statistical Test	p	Effect Size
Race/Ethnicity			F(2, 241) = 1.85	.16	
African American	8.73	7.61			
Caucasian	7.17	6.17			
Hispanic	5.39	5.23			
Race			t(35) = 1.07	.29	d = .25
African American	8.73	7.61			
Caucasian	7.17	6.17			
Insurance Type			t(208) = 3.89	< .001	d = .49
Medicaid	8.31	6.70			
Commercial	5.30	5.05			
Marital Status			t(204) = 3.25	< .001	d = .41
Single	8.06	6.61			
Married	5.51	5.30			

Delivery type			t(240) = 1.84	.067	d = .25
C-section	8.22	6.82			
Standard Vaginal	6.67	5.94			

Summary of Findings

Overall, the addition of early postpartum visits made a statistically significant positive impact on patients' EPDS scores. The first objective, compare postpartum depression rates in women who received usual postpartum care via a six-week postpartum visit only (the pre group) with women who received optimized postpartum care with the addition of a one week visit in the office and a three-week virtual or in-office visit if needed (the post group), found that patients who attended early postpartum visits were more likely to have lower postpartum depression screening scores.

The second objective, compare breastfeeding continuation rates before and after the practice change, found that there was not a difference in breast feeding rates among women attending earlier postpartum visits and women who attended only the six-week postpartum visit. However, objective three, compare breastfeeding rates with postpartum depression symptoms, did show that women who were treated for postpartum depression were significantly less likely to breast feed. Furthermore, while not statistically significant, the average EPDS scores at the six-week postpartum visit were lower in women who were breast feeding than in women who were bottle feeding and women who were combination breast and bottle feeding. Finally, objective four, compare demographic characteristics such as insurance status, maternal age, marital status, and race with EPDS scores, found that EPDS scores were significantly higher in women who had Medicaid insurance coverage compared to commercial insurance and who were single compared to married.

Chapter V: Discussion and Conclusion of Findings

It is important to summarize the purpose of this project to have a comprehensive understanding of the discussion of findings. Within the literature review, it was found that intense focus on women's health during pregnancy is unbalanced by infrequent and late postpartum care (Tully et al., 2017). The fourth trimester, or postpartum period, is a largely neglected aspect of women's health care. Given that more than half of pregnancy-related deaths occur after the birth of the infant, with substantial morbidity occurring in the early postpartum period, increasing the number of visits and amount of time spent with patients during the postpartum period may improve patient outcomes, decreasing morbidity and mortality in the fourth trimester (Langan et al., 2016). This project directly addressed the impact of increased postpartum care on postpartum depression. The more time that providers can spend with patients, providing support and education, during this critical time, the more likely that depression and anxiety can be addressed at an early stage.

This purpose of the DNP project was to implement optimized postpartum care and measure outcomes, such as postpartum depression, as well as breastfeeding continuation rates, to evaluate if these outcomes were improved by implementing evidence-based practice. There were four objectives. The first objective was to compare postpartum depression rates in women who received usual postpartum care via a six-week postpartum visit only (the pre-group) with women who received optimized postpartum care with the addition of a one week visit in the office and a three-week virtual or in office visit if needed (the post group). The second objective was to compare breastfeeding continuation rates before and after the practice change. The third objective was to compare breastfeeding rates with postpartum depression symptoms. Finally, the

fourth objective was to compare demographic characteristics such as insurance status, maternal age, marital status, and race with EPDS scores.

EPDS Scores Before and After Optimized Postpartum Care

The results comparing postpartum depression rates in women who received usual postpartum care via a six-week postpartum visit only (the pre-group) with women who received optimized postpartum care with the addition of a one-week postpartum visit in the office and ongoing care with a three-week virtual or in office visit if needed (the post-group) were used to evaluate if early postpartum visits had an impact on postpartum depression symptoms at six-weeks postpartum. A decrease in the mean EPDS score, 6.17, at six-weeks postpartum in the post-group, compared to the mean EPDS score, 7.77, at six-weeks postpartum in the pre-group demonstrates that the early postpartum visits had a statistically, and thus clinically significant impact overall in postpartum depression symptoms.

When comparing EPDS scores of the pre- and post-practice change groups using severity ranges, the results found a 16.6% decrease in the no depression range in the post-practice change group, a 5.5% decrease in the moderate depression range in the post-practice change group, and a 6.2% decrease in the severe depression range in the post-practice change group. The only severity range group that saw an increase in the post-practice change group was the mild depression severity range, which saw an increase of 6.5%. These results were *not* statistically significant, however, the fact that three out of four depression severity range groups saw a decrease in numbers, and the only severity range that saw an increase was in the mild depression severity range, could be seen as clinically significant.

Interestingly, the chart reviews found that approximately 35% of the patient population in the 2019 pre-group and 33% of the 2020 pre-group had a history of depression prior to delivery.

In 2021, the patient population with a history of depression prior to delivery increased to approximately 41%. It could be theorized that the COVID-19 pandemic had a role to play in the increased percentage of pre-existing depression and anxiety in 2021 compared to the 2019 and 2020 pre-practice change groups. Given an increase in the percentage of patients who had a history of depression in the 2021 post-group, the EPDS mean scores were still statistically significantly lower than the pre-practice change groups. Even though not statistically significant, the no depression, moderate depression, and severe depression range percentages on the EPDS depression severity range groups were lower in the post-practice change group, even with a larger percentage of women having a history of depression in 2021.

Breastfeeding Continuation Rates

The results comparing breastfeeding continuation rates in women who had received the six-week postpartum visit only (pre-group) and women who received early postpartum visits (post-group) were used to evaluate if early postpartum visits had an impact on the continuation of breastfeeding among mothers who started out breastfeeding at birth. The rate of breastfeeding among mothers who were breastfeeding upon discharge to the hospital decreased by 28.7% at six weeks postpartum in 2019, 36.7% in 2020, and 33.9% in 2021. These results were not statistically significant and indicate that the early postpartum visits were not effective in increasing breastfeeding continuation rates.

Breastfeeding and EPDS Scores

The EPDS scores and breastfeeding continuation results were evaluated to determine if there was a relationship between breastfeeding continuation and postpartum depressive symptoms. The mean EPDS score of mothers who were continuing to breastfeed at the six-week postpartum visit, 6.71, was lower than the mean EPDS score of bottle-feeding mothers, 7.85.

These results were not statistically significant, but may be clinically significant, especially when evaluating the mean EPDS scores in the context of the depression severity ranges. When using the EPDS depression severity ranges, the mean EPDS score in breastfeeding mothers falls in the no depression range, while the mean EPDS score of bottle-feeding mothers falls into the mild depression range.

After seeing the difference between breast and bottle-feeding mothers in the EPDS depression severity ranges, mothers who were treated for postpartum depression were evaluated for method of infant feeding at the six-week postpartum visit. Only 19.2% of mothers who were breastfeeding were treated for postpartum depression. This was significantly lower than the 38.2% of mothers who were bottle-feeding and the 32.3% of mothers who were combination feeding who were treated for postpartum depression with either medication, counseling, or a combination of both. These results indicate that there is a relationship between postpartum depression, postpartum depression treatment, and breastfeeding rates. While there does appear to be a relationship, causation is not able to be determined. Does postpartum depression inhibit breastfeeding success, or do problems associated with breastfeeding exacerbate postpartum depression symptoms? While these results to not give an answer to these questions, they do indicate a relationship. Knowing that there is a relationship between postpartum depression and breastfeeding, allows practitioners to provide additional support and attention to mothers who are struggling with breastfeeding or symptoms of postpartum depression.

Demographics and EPDS Scores

It was important to examine any correlation between symptoms of postpartum depression and demographics, such as race/ethnicity, insurance, marital status, and type of delivery. The mean EPDS scores were found to be statistically significantly higher in mothers who were single

(8.06) and in mothers with Medicaid coverage (8.31) when compared to mothers who were married (5.51) and mothers with commercial insurance (5.30). These results indicate that single mothers and mothers with Medicaid insurance coverage are at an increased risk for postpartum depression symptoms. While not statistically significant, mean EPDS scores were higher in African American mothers (8.73) and in mothers who delivered by cesarean section (8.22), when compared to Caucasian mothers (7.17), Hispanic mothers (5.39), and mothers who delivered vaginally (5.51). These differences in mean EPDS scores also fall in different EPDS depression severity range groups, no depression versus mild depression, and therefore could be clinically significant. Also, practitioners should take these multiple demographic groups into account when assessing risk for postpartum depression. For example, a Caucasian, single mother with Medicaid coverage, who delivered by cesarean section, may be at an increased risk for developing postpartum depression when compared to a Hispanic, married mother, with commercial insurance who delivered vaginally.

Limitations

This project did have several limitations. These included research limitations and logistical limitations. Research limitations include a lack of variety in the sample, for example approximately 76% of the participants were Caucasian. While the findings of this project were overall positive and statistically significant, they should be deciphered in relation to the limitations of this particular project.

A second limitation of the project includes the timing of the comprehensive postpartum visit. The final comprehensive postpartum visit took place at six-weeks postpartum. A greater difference in EPDS scores may be seen if the final comprehensive postpartum visit took place at twelve weeks postpartum instead of six, with ongoing care taking place as needed at six-weeks

postpartum. Initiating treatment at one-week or three-weeks postpartum does not give much time for mothers to experience a significant improvement in symptoms by the six-week visit. Furthermore, mothers may not develop symptoms of postpartum depression until six-weeks post-delivery or after.

There were a large number of participants that had to be excluded from the project due to not showing for the six-week postpartum appointment. The post-practice change group had 24 mothers who did not show for their six-week visit and the pre-practice change group from 2019/2020 had 28 mothers who did not show for their six-week appointments.

Finally, when evaluating the EPDS depression severity ranges, the number of mothers in the moderate and severe ranges were small. An increase in the number of participants in these ranges may improve the chances to see statistically significant results.

Implications for Practice

The project demonstrated that early postpartum visits can make a positive difference in postpartum depression symptoms and possibly breastfeeding rates. Early postpartum touchpoints allow providers to address mothers' concerns and educate on normal postpartum progression. If postpartum depression can be identified at an early stage, treatment can be initiated and, hopefully, decrease the severity of symptoms. The early identification of postpartum depression signs and symptoms can also allow providers the opportunity to provide additional breastfeeding support to mothers who desire to breastfeed. Early postpartum touchpoints can aid in the detection of mothers who are struggling with breastfeeding problems, so that help may be provided prior to breastfeeding cessation, thereby increasing breastfeeding rates and possibly decreasing postpartum depression symptoms.

Recommendations for Further Research

This project examined how early postpartum touchpoints may impact postpartum depression symptoms and breastfeeding rates, as well as the relationship between postpartum depression symptoms and breastfeeding. While a statistically significant decrease in mean EPDS scores was seen in mothers who received early postpartum visits, there are many opportunities for further research.

Further research including a more diverse population would be beneficial, so that results could be applied to more diverse areas of practice. Implementing early postpartum visits, in addition to extending the final comprehensive postpartum visit to twelve weeks postpartum, could be performed to better evaluate the development of postpartum depression and the effectiveness of treatment interventions. Another opportunity for further research would be the addition of the presence of a lactation consultant or educator at postpartum visits for mothers who have questions or concerns about breastfeeding.

Conclusion

The fourth trimester, or postpartum period, is a largely neglected aspect of women's health care. This project addressed this practice gap and afforded women the attention they deserve during the postpartum period. Given that more than half of pregnancy-related deaths occur after the birth of the infant, with substantial morbidity occurring in the early postpartum period, increasing the number of visits and amount of time spent with patients during the postpartum period may improve patient outcomes, decreasing morbidity and mortality in the fourth trimester (Langan et al., 2016). In addition, depression during or immediately after pregnancy is a common medical complication affecting one in seven women and is associated with significant neonatal and maternal morbidity (Langan et al., 2016). Furthermore, the addition of earlier postpartum patient touchpoints brought the practice setting into compliance with the

ACOG recommendation for optimized postpartum care. This project directly addressed the impact of increased postpartum care on postpartum depression. The objectives of this project were to (1) compare postpartum depression rates in women who received usual postpartum care via a six-week postpartum visit only (the pre group) with women who received optimized postpartum care with the addition of a one week visit in the office and a three-week virtual or in office visit if needed (the post group); (2) compare breastfeeding continuation rates before and after the practice change; (3) compare breastfeeding rates with postpartum depression symptoms; and (4) compare demographic characteristics such as insurance status, maternal age, marital status, and race with EPDS scores.

Results of EPDS scores pre- and post-practice change indicated that overall, early postpartum visits made a positive impact on the presence and severity of postpartum depression symptoms. There was a correlation between bottle-feeding and the treatment for postpartum depression. There was also a correlation between marital status and insurance coverage related to EPDS scores.

The COVID-19 pandemic has certainly had an impact on depression and anxiety in pregnant and postpartum women. A recent study by Archana Basu conducted May 26 through June 13, 2020, revealed that a substantial number of pregnant and postpartum women had elevated symptoms of anxiety and depression, as well as loneliness (MGH Center for Women's Mental Health, 2021). This project was certainly affected by the COVID-19 pandemic. No show rates may have been worsened by mothers worried about office visits and COVID exposure. Virtual visits can be complicated by technology problems or lack of technology. However, because of and despite the issues that the COVID-19 pandemic presents, postpartum care is more important than ever before. Screening for mental health symptoms is imperative due to the

increased levels of distress experienced during pregnancy and the postpartum period. Postpartum care can target these feelings of loneliness, educate new mothers, and provide coping strategies for anxiety and depression.

In conclusion, the addition of early postpartum visits could make a positive impact in the presence and severity of postpartum depression symptoms, thereby decreasing maternal and infant morbidity and mortality. Early postpartum visits could also potentially have an impact on breastfeeding rates, by improving symptoms of postpartum depression, or decreasing postpartum depression symptoms by addressing breastfeeding concerns. Further studies are needed to examine the relationship between breastfeeding and postpartum depression, as well as evaluate how improved postpartum care can impact postpartum depression. Additional studies to address the differences in postpartum depression rates pre and post COVID-19 pandemic, as well as the effectiveness of different types of treatment would be beneficial.

Appendix A: Edinburgh Postnatal Depression Scale

Edinburgh Postnatal Depression Scale[1] (EPDS)

Name: _____ Address: _____

Your Date of Birth: _____ _____

Baby's Date of Birth: _____ Phone: _____

As you are pregnant or have recently had a baby, we would like to know how you are feeling. Please check the answer that comes closest to how you have felt **IN THE PAST 7 DAYS**, not just how you feel today.

Here is an example, already completed.

I have felt happy:
- ☐ Yes, all the time
- ☒ Yes, most of the time
- ☐ No, not very often
- ☐ No, not at all

This would mean: "I have felt happy most of the time" during the past week. Please complete the other questions in the same way.

In the past 7 days:

1. I have been able to laugh and see the funny side of things
   - ☐ As much as I always could
   - ☐ Not quite so 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
   - ☐ 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

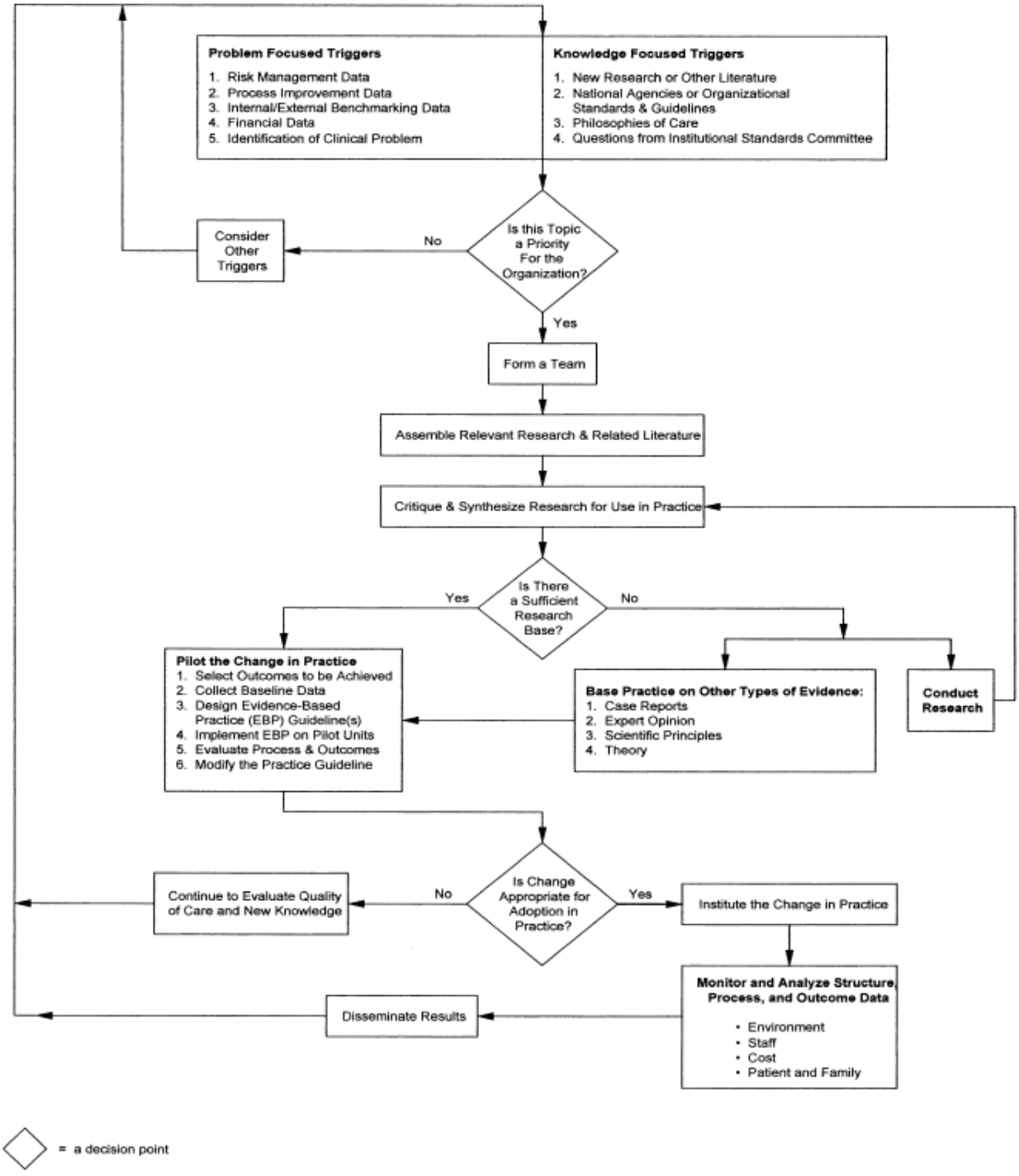
*10 The thought of harming myself has occurred to me
   - ☐ Yes, quite often
   - ☐ Sometimes
   - ☐ Hardly ever
   - ☐ Never

Administered/Reviewed by _____ Date _____

[1]Source: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. *British Journal of Psychiatry* 150:782-786 .

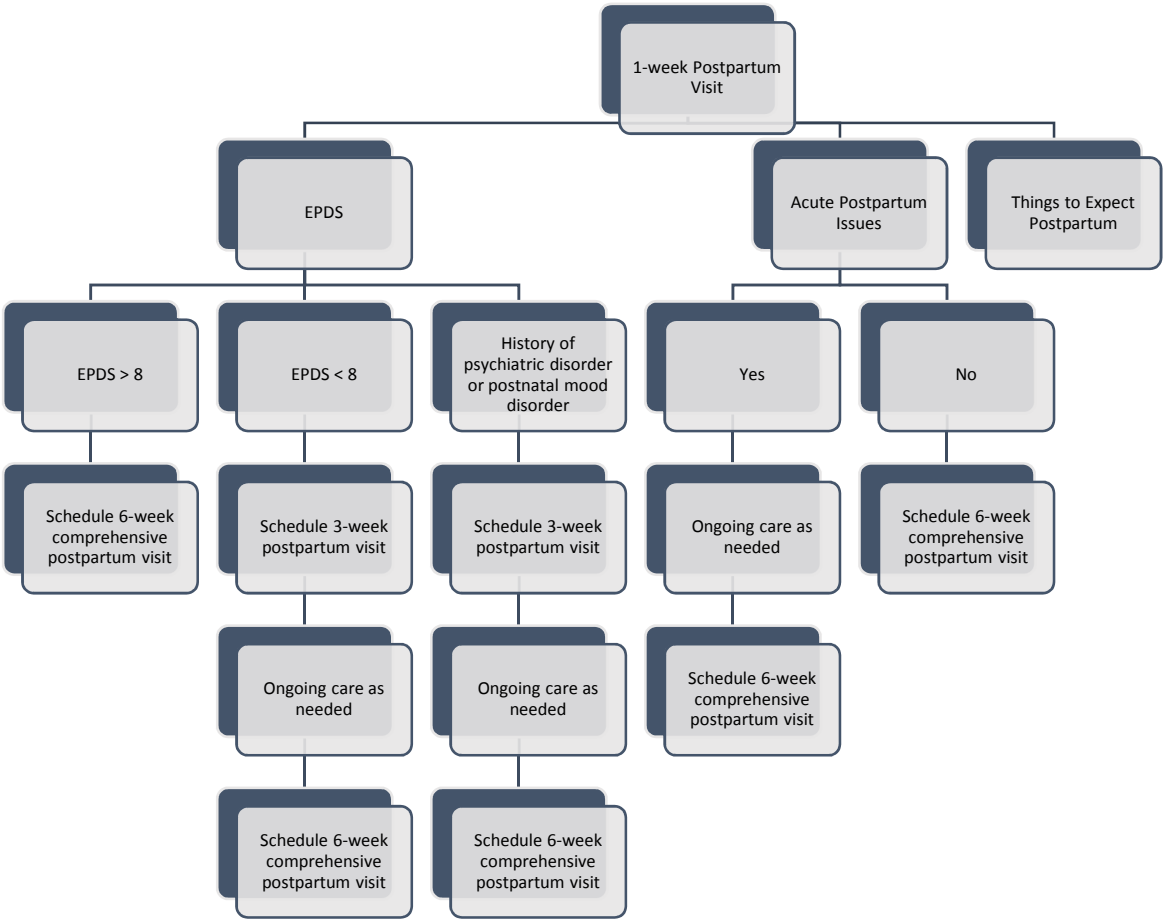
[2]Source: K. L. Wisner, B. L. Parry, C. M. Piontek, Postpartum Depression N Engl J Med vol. 347, No 3, July 18, 2002, 194-199

Appendix B: Iowa Model for Evidence-Based Practice



(Source: Titler et al., 2001)

Appendix C: Postpartum Visit Flow Sheet



References

AJMC Staff. (2021, January 1). *A timeline of COVID-19 developments in 2020.* AJMC. https://www.ajmc.com/view/a-timeline-of-covid19-developments-in-2020

Austin, M. V., Hadzi-Pavlovic, D., Priest, S. R., Reilly, N., Wilhelm, D., Saint, K., & Parker, G. (2010). Depressive and anxiety disorders in the postpartum period: How prevalent are they and can we improve their detection? *Archives of Women's Health, 13,* 395-401. https://doi.org/10.1007/s00737-010-0153-7-242. https://doi.org/10.1007/s00737-006-0132-1

Brown, H. L. (2019). Redefining postpartum care. *Contemporary OB/GYN, 64*(5). https://www.contemporaryobgyn.net/postpartum-care/redefining-postpartum-care

Cincinnati Children's Hospital Medical Center. (2019). Evidence evaluation tools and resources (LEGEND). Retrieved from: https://www.cincinnatichildrens.org/service/j/anderson-center/evidence-based-care/legend

Dennis, C. L. (2004). Can we identify mothers at risk for postpartum depression in the immediate postpartum period using the Edinburgh Postnatal Depression Scale? *Journal of Affective Disorders, 78,* 163-169. http://doi.org/10.1016/S0165-0327(02)00299-9

Echevarria, I. & Walker, S. (2014. To make your case, start with a PICOT question. *Nursing, 44*(2), 18-19. https://doi.org/10.1097/01.NURSE.0000442594.00242.f9

Goulet, L., D'Amour, D., & Pineault, R. (2008). Type and timing of services following postnatal discharge: Do they make a difference? *Women & Health, 45*(4), 19-39. https://doi.org/10.1300J013v45n04_02

Hadfield, H. & Wittkowski, A. (2017). Women's experiences of seeking and receiving

psychological and psychosocial interventions for postpartum depression: A systematic review and thematic synthesis of the qualitative literature. *Journal of Midwifery & Women's Health, 62*(6), 723-736. https://doi.org/10.1111/jmwh.12669

Healthy Communities Institute. (2015, October). *St. Vincent Madison County service area community health needs assessment report 2016*. https://healthcare.ascension.org/-/media/healthcare/compliance-documents/indiana/2016-st-vincent-mercy-chna-report.pdf

Howell, E. A., Balbierz, A., Wang, J., Parides, M., Zlotnick, C., & Leventhal, H. (2012). Reducing postpartum depressive symptoms among black and Latina mothers: A randomized controlled trial. *Obstetrics & Gynecology, 119*(5), 942-949. https://doi.org/10.1097/AOG.0b013e318250ba48

Iowa Model Collaborative. (2017). Iowa model of evidence-based practice: Revisions and validation. *Worldviews on Evidence-Based Nursing, 14*(3), 175-182. doi: 10.1111/wvn.12223

Labarere, J., Gelbert-Baudina, N., Ayral, A., Duc, C., Berchotteau, M., Bouchon, N., Schelstraete, C., Vittoz, J., Francois, P., & Pons, J. (2005). Efficacy of breastfeeding support provided by trained clinicians during an early, routine, preventive visit: A prospective, randomized, open trial of 226 mother-infant pairs. *Pediatrics, 115*(2), e139-e146. https://doi.org/10.1542/peds.2004-1362

Langan, R. C. & Goodbred, A. J. (2016). Identification and management of peripartum depression. *American Family Physician, 93*(10), 852-858.

Leins, C. (2019, June 12). States with the highest maternal mortality rates: Some states' maternal

mortality rates match those of developing countries. *U.S. News*. https://www.usnews.com/news/best-states/articles/2019-06-12/these-states-have-the-highest-maternal-mortality-rates

McCabe-Beane, J. E., Segre, L. S., Perkhounkova, Y., Stuart, S., & O'Hara, M.W. (2016). The identification of severity ranges for the Edinburgh Postnatal Depression Scale. *Journal of Reproductive and Infant Psychology, 33*(3), 293-303. https://doi.org/10.1080/02646838.2016.1141346

Mercer, R. T. (2004). Becoming a mother versus maternal role attainment. *Journal of Nursing Scholarship, 36*(3), 226-232. https://doi.org/10.1111/j.1547-5069.2004.04042.x

MGH Center for Women's Mental Health. (2021, April 27). High levels of distress in pregnant and postpartum women during the pandemic. Retrieved from https://womensmentalhealth.org/posts/pandemic-distress/

MGH Center for Women's Mental Health. (2018, October 3). Using the EPDS during pregnancy: What exactly are we screening for? Retrieved from https://womensmentalhealth.org/posts/using-the-epds-during-pregnancy-what-exactly-are-we-screening-for/

Moran, K., Burson, R., & Conrad, D. (2020). *The Doctor of Nursing practice project: A framework for success* (3rd ed.). Burlington, MA: Jones and Bartlett Learning

Navarro, P., Ascaso, C., Garcia-Esteve, L., Aguado, J., Torres, A., & Martin-Santos, R. (2007). Postnatal psychiatric morbidity: A validation study of the GHQ-12 and the EPDS as screening tools. *General Hospital Psychiatry, 29,* 1-7. https://doi.org/10.1016/j.genhosppsych.2006.10.004

National Institute for Health and Care Excellence. (2021, April 20). *Postnatal care.* NICE

Guidance. https://www.nice.org.uk/guidance/ng194/chapter/Recommendations #organisation-and-delivery-of-postnatal-care

National Institute of Mental Health. (n.d.). *Perinatal depression.* Transforming the understanding and treatment of mental illness. https://www.nimh.nih.gov/health/publications/perinatal-depression/index.shtml

Parsa, B., Parisa, P., Boojarzadeh, B., & Mohammadi, Y. (2019). Prediction of postpartum depression based on women's quality of life. *Family Medicine & Primary Care Review, 21*(4), 343-348. https://doi: https://doi.org/10.5114/fmpcr.2019.90165.

Posmontier, B., Neugebauer, R., Stuart, S., Chittams, J., & Shaughnessy, R. (2016). Telephone-administered interpersonal psychotherapy by nurse-midwives for postpartum depression. *Journal of Midwifery & Women's Health, 61*(4), 456-466. https://doi.org/10.1111/jmwh.12411

Schein, E. (2017). *Organizational culture and leadership* (5th ed.). Hoboken, NJ: Wiley.

Slomian, J., Emonts, P., Vigneron, L., Acconcia, A., Glowacz, F., Reginster, J. Y., Oumourgh, M., & Bruyere, O. (2017). Identifying maternal needs following childbirth: A qualitative study among mothers, fathers, and professionals. *BMC Pregnancy and Childbirth, 17*(213). https://doi.org/10.1186/s12884-017-1398-1

Stuebe, A., Auguste, T., & Gulati, M. (2018). ACOG committee opinion no. 736: Optimizing postpartum care. *Obstetrics & Gynecology, 131*(5), e140-e150. http://doi.org/ 10.1097/AOG.0000000000002633

Titler, M., Kleiber, C., Steelman, V., Rakel, B., Budreau, G., Everett, L., ... Goode, C. J. (2001). The Iowa Model of evidence-based practice to promote quality care. Critical Care Nursing Clinics of North America, 13(4), 497-509.

Tully, K., Stuebe, A. M., & Verbiest, S. B. (2017). The fourth trimester: a critical transition period with unmet maternal health needs. *American Journal of Obstetrics and Gynecology,* 37-41. https://dx.doi.org/10.1016/j.ajog.2017.03/032

Wisner, K. L., Sit, D. K. Y., McShea, M. C., Rizzo, D. M., Zoretich, R. A., Hughes, C. L., Eng, H. F., Luther, J. F., Wisniewski, S. R., Costantino, M. L., Confer, A. L., Moses-Kolko, E., L., Famy, C. S., & Hanusa, B. H. (2013). Onset timing, thoughts of self-harm and diagnoses in postpartum women with screen-positive depression findings. *JAMA Psychiatry, 70*(5), 490-498. http://doi.org/10.1001/jamapsychiatry.2013.87

of Women's Mental Health, 10, 171-175. https://doi.org/10.1007/s00737-007-0191-y

World Health Organization. (2013, October). *WHO recommendations on postnatal care of the mother and newborn*. https://cdn1.sph.harvard.edu/wp-content/uploads/sites/2413/2017/06/9789241506649_eng.pdf

Wouk, K., Stuebe, A. M., & Meltzer-Brody, S. (2016). Postpartum mental health and breastfeeding practices: An analysis using the 2010-2011 pregnancy risk assessment monitoring system. *Maternal Child Health Journal, 21,* 636-647. https://doi.org/10.1007/s10995-016-2150-6