

EARLY POSTPARTUM DEPRESSION SCREENING

A DOCTOR OF NURSING PRACTICE PROJECT SUBMITTED TO THE OFFICE OF
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Dedication

This is dedicated to my husband, John and my two little girls, Katelynn and Kamilynn.

Acknowledgement

To my committee chairperson, Dr. Maureen Shannon, committee member, Dr. Deborah Mattheus, and my external advisor Dr. Alexandra Sueda, I would like to express my gratitude. The support and constructive feedback throughout this journey has been greatly appreciated. To the Special Delivery Program staff, mentors, and leadership team at Kaiser Permanente, thank-you for embracing this project and helping to make a difference, even just a little one. Lastly, the talented PERRLA group for the extraordinary tech support.

Abstract

In Hawai‘i, postpartum depression (PPD) has a prevalence rate of 14 to 15 percent, affecting about 3,000 women annually (Hayes, Shor, & Fuddy, 2010). Postpartum depression is defined in the Diagnostic and Statistical Manual of Mental Disorders (DSM IV) as a “Major depressive condition that occurs in the one year period following childbirth” (Grier & Geraghty, 2015, p. 110). After delivery, women with PPD experience feelings of sadness, loneliness, or inadequacies daily for at least two weeks. Additional symptoms include erratic sleep patterns, anxiety, or the inability to care for oneself or the newborn infant.

In the Kaiser Permanente (KP) organization, postpartum depression screening occurs in the antepartum (third trimester) during pregnancy and repeated during the routine four to six week postpartum visit. This project implemented a validated depression-screening tool between one to three days post hospital discharge at the KP Special Delivery Program clinics. The goal was to screen for early postpartum depressive symptoms, and if detected, initiating an immediate referral to the KP Integrated Behavioral Health (IBH) for further diagnostic evaluation and treatment. There is no current screening program for depressive symptoms during the early postpartum period in the KP Hawai‘i region.

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List of Abbreviations

ACOG- American College of Obstetricians and Gynecologists

APRN- Advance Practice Registered Nurse

DNP- Doctor of Nursing Practice

EBP- Evidence-Based Practice

EMR- Electronic medical record

FNP- Family Nurse Practitioner

EPDS- Edinburgh Postnatal Depression Scale

IBH- Integrated Behavioral Health

KP- Kaiser Permanente

MA- Medical Assistant

MD- Doctor of Medicine

OBGYN- Obstetrics and Gynecology

PHN- Public Health Nurse

PHQ-9- Patient Health Questionnaire-9

PP- Postpartum psychosis

PPD- Postpartum Depression

PNP- Pediatric Nurse Practitioner

QI- Quality Improvement

RN- Registered Nurse

SDP- Special Delivery Program

UH- University of Hawai‘i at Mānoa

CHAPTER 1. EXECUTIVE SUMMARY

Postpartum depression (PPD) is a significant health problem nationwide. In the United States, approximately “14-15% of women experience depression in the first 3 months after childbirth” (Hanusa, Hudson Scholle, Haskett, Spadaro, & Wisner, 2008, p. 586). In Hawai‘i, one in every seven women or 14.5% with a recent live birth, were found to have self-reported postpartum depressive symptoms (Hayes et al., 2010). The Special Delivery Program (SDP) performs newborn care and lactation assistance to all infants one to three days following hospital discharge. Prior to this Doctor of Nursing Practice (DNP) project, the SDP did not screen for postpartum depression. This DNP project was developed to result in practice change of the early depression-screening program and bridge this gap.

The conceptual framework selected for this quality improvement (QI) project was the John Hopkins Nursing Evidence-Based Practice Model. The three major categories included in this model are, problem, evaluation and translation. Utilizing these three components, the Johns Hopkins Nursing Evidence-Based Practice Model creates a detailed, 18-step approach to assist health professionals with a concise implementation plan.

The review of literature revealed a number of recommendations. The first was the use of a validated instrument. The Patient Health Questionnaire-9 (PHQ-9) is an instrument that had been previously validated and is currently being utilized by all Kaiser Permanente primary care outpatient clinics. Based on the literature synthesis, the PHQ-9 and Edinburgh Postnatal Depression Scale (EPDS) screening instruments are validated, feasible, and efficient in the primary care setting. Kaiser Permanente (KP) currently utilizes the PHQ-9 in clinical practice throughout the Hawai‘i region. This was the validated screening instrument utilized throughout

this project. The second recommendation was to create a multi-disciplinary team to address PPD (ACOG, 2015). This team was comprised of physicians, nurses, social workers and a member from the KP Integrated Behavioral Health (IBH). The IBH department provides patient services, such as counseling or medication management related to any mental health concern. The final recommendation was to identify high-risk mothers for PPD based on associated risk factors and the PPD screen. Early identification and screening at regular intervals throughout the pregnancy and postnatal period is critical in this population.

The primary sites for this QI project is the KP Mapunapuna and Moanalua outpatient clinics. The practice change was performed in the SDP. The SDP staff is comprised of three advance practice registered nurses (APRN), one registered nurse (RN), and one medical assistant (MA). The innovation of this QI project was to implement an early depression-screening program in the SDP. The objectives were to: a) initiate an early depression screening program; b) screen for PPD utilizing the PHQ-9 for all mothers in the SDP one to three days after hospital discharge; c) provide quality monitoring of PHQ-9 scores at three data points: antepartum, the SDP visit (at one to three days after discharge), and the routine postpartum visit (at four to six weeks after birth); and d) immediate referral to activate further diagnosis of and treatment for PPD with IBH for PHQ-9 positive screenings.

This project utilized the PHQ-9 for PPD screening in the SDP. This validated self-reporting screening tool has a sensitivity of 75% and specificity of 90% (Flynn, Sexton, Ratliff, Porter, & Zivin, 2011). There are a total of nine questions, with scores ranging from zero to a maximum score of twenty-seven. A cut-off score of five and greater was applied, which correlates to mild depression symptoms based on the KP depression management guidelines.

The targeted population for this QI project was postpartum women one to three days after hospital discharge. The accessible sample were mothers attending the SDP clinic appointment with their infant. The expected sample size for this QI project was approximately 300 to 350 mothers over a three to four month period that have completed the initial PHQ-9 screening during pregnancy and needed follow up screening during the postpartum period (Ater, 2016). The anticipated sample size is based on the quarterly SDP census data. These figures vary due to high peak seasons during the summer and winter months.

The project had multiple limitations. The first limitation was related to the setting of the project. The variables and conditions related to the site were not controlled. The second limitation was the sample population. There was no randomization or control group for this project. The inclusion criterion was broad, thus allowing nearly all participants to be apart of this project. There were minimal exclusion criteria for this sample population. This had the potential to contribute to distribution and representation limitations within the sample. The final limitation was related to the screening instrument utilized in this project. The PHQ-9 screening questionnaire is a self-reported tool available in English and Spanish. The PHQ-9 scores are generated from participant responses, potentially leading to higher or lower scores causing possible discrepancies. The data analysis section did not include any risk adjustments.

The program evaluation for this project was focused on two process measures and four outcomes measures. The first process outcome was the SDP staff attendance to the training session on the PHQ-9 scoring and documentation in the electronic medical record (EMR). The second process outcome focused on the SDP APRNs attendance to the training session on the PHQ-9 workflow process and the IBH referral process (see Table 2). Both process outcomes had

an expected target set at 100% compliance. The first outcome measure appraised the overall percentage of women attending the SDP clinic who are screened with the PHQ-9. The second outcome measure evaluated the compliance of the SDP staff with the referral process to IBH. The third outcome assessed the financial impact of this project based on the monthly SDP staff overtime exceeding baseline. The final outcome measure evaluated the percentage of attendance by participants to the newly formed KP PPD support group.

In summary, PPD is essential for the well being of the mother and family unit. It has been reported in Hawai'i that approximately 14% of women experience depressive symptoms during the postpartum phase (Hayes et al., 2010). Therefore, early screening, diagnosis, and treatment of PPD may reduce the negative impacts associated with this serious psychological condition.

CHAPTER 2. PROBLEM

Having a baby is one of the greatest aspects in life with many challenges that arise in this transition to parenthood. Pregnancy allows parents a gradual adjustment to bringing an infant into this world. The prenatal period builds the relationship between parents and their growing baby, which can be facilitated with the help of the health care provider. During the birth, parents experience feelings of nervousness, excitement, and happiness. As the infant arrives, the dreams and hopes for the new child become a reality. This life-changing event can be stressful, presenting many physical, emotional, and psychological obstacles (Giannandrea, Ceruli, Anson, & Chaudron, 2013).

Postpartum depression (PPD) is a serious health problem that can develop during pregnancy and after delivery. Postpartum depression screening and early intervention are essential to minimizing the negative impacts to the family unit and newborn. The purpose of this project was to implement an early (i.e., between one to three days post hospital discharge) PPD screening program. The first section of chapter two will present the background of PPD and the problem statement for this project. The conceptual framework for this project was the John Hopkins Nursing Evidence-Based Practice Model. The application of this model to this DNP project will be reviewed in this chapter. The subsequent sections expand on the evidence, including a synthesis and critique of the literature. The final section addresses the innovations and objectives with a final summary of the project.

Conceptual framework

The conceptual framework selected for this DNP project was the Johns Hopkins Nursing Evidence-Based Practice Model (see Figure 1). This model was created from nursing leaders,

educators, and clinical practitioners working together to design a conceptual model combining both disciplines (Schaffer, Sandau, & Diedrick, 2013). The three major themes to this model include practice, education, and research. The illustration (see Figure 1) demonstrates the role of external and internal factors impacting both research and non-research. Based on the components of Evidence-Based Practice (EBP), the categories of problem, evidence, and translation are integrated. Utilizing these three components, the Johns Hopkins Nursing Evidence-Based Practice Model is organized with a step-by-step approach, that includes a total of 18 steps for implementation (see Figure 2).

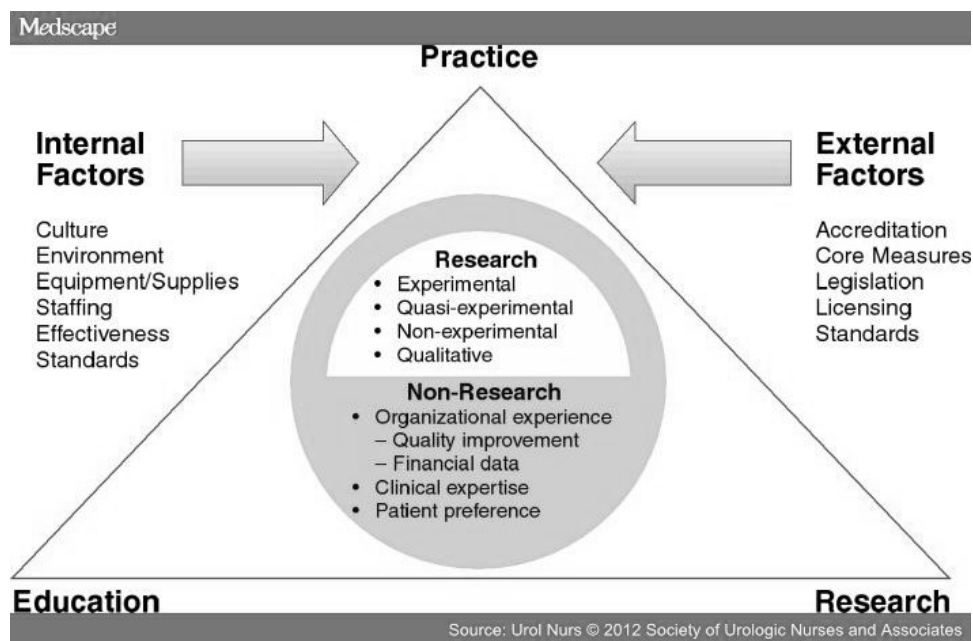
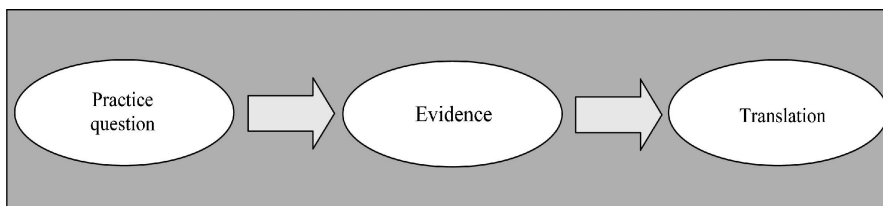


Figure 1. The Johns Hopkins Nursing Evidence-Based Practice Model. (Newhouse, Dearbolt, Poe, Pugh, & White, 2004)

The first section of the framework was the identification of a clinical practice question, by utilizing a team approach (Schaffer et al., 2013). This is reflected in steps one to five of the model with the implementation of the multi-disciplinary team approach (see Figure 2). The team

for this project consisted of the Obstetrics and Gynecology staff as well as physicians, leading the way for the initial step of PHQ-9 screening. The core members of this team are the Special Delivery Program (SDP) staff and manager. The last component of the team is the Kaiser Permanente (KP) Integrated Behavioral Health (IBH) staff and clinicians. The targeted population for this project was postpartum women one to three days after hospital discharge attending the SDP clinics. The Patient Health Questionnaire-9 (PHQ-9) is the preferred depression-screening tool by KP and was utilized for this project.



Practice question

- Step 1: Identify an EBP question
- Step 2: Define scope of practice question
- Step 3: Assign responsibility for leadership
- Step 4: Recruit multidisciplinary team
- Step 5: Schedule team conference

Evidence

- Step 6: Conduct internal and external search for evidence
- Step 7: Critique all types of evidence
- Step 8: Summarize evidence
- Step 9: Rate strength of evidence
- Step 10: Develop recommendations for change in processes of care or systems on the basis of strength of evidence

Translation

- Step 11: Determine appropriateness and feasibility of translating recommendations into the specific practice setting
- Step 12: Create action plan
- Step 13: Implement change
- Step 14: Evaluate outcomes
- Step 15: Report results of preliminary evaluation to decision makers
- Step 16: Secure support from decision makers to implement recommended change internally
- Step 17: Identify next steps
- Step 18: Communicate findings

Figure 2. The Johns Hopkins Nursing Evidence-Based Practice Model 18 steps for implementation (Newhouse et al., 2004).

The second phase of the model, steps six to ten, includes an extensive literature search and critique of the evidence (see Figure 2). This literature search notes a wide range of evidence on topics related to PPD. The literature search focused on evaluating the two most commonly

utilized screening tools for PPD, the PHQ-9 and the Edinburgh Postnatal Depression Scale (EPDS). Additional areas included in this literature search were the risk factors, prevalence, and treatment for PPD.

The final section of this conceptual model is the translation of the evidence into clinical practice. Steps 11 to 18 include the translation of the recommendations into the actual clinical practice setting (see Figure 2). This consisted of creating an action plan, implementation, evaluation the outcomes, and determining the next steps. During this translation period, the model evaluates the feasibility and appropriateness of the practice change. The proposed practice change was to implement an early depression-screening program. The aim is the early identification of PPD symptoms and referral for further diagnostic evaluation by the initiation of treatment from the KP IBH staff. Early activation of services through IBH ensures timely access to professional support.

Background

There are three classes of mood disturbances that can occur during the first year of the postpartum period. These phases may develop in gradual progression or can be unpredictable. The first category is baby blues, the second is postpartum depression, and the final class is postpartum psychosis (Zubaran, Schumacher, Roxo, & Foesti, 2010).

Baby blues. During the early postpartum period, “baby blues” can occur in the first few weeks after childbirth, lasting for two weeks (Miller & MacDonald, 2011). These symptoms include anxiety, irritability, and crying, worsening by postpartum day four or five, resolving spontaneously within two weeks. Grabbe et al. (2012) stated baby blues is a transient phase, which is experienced by an estimated 80% of new mothers, resolving by 10 days after birth.

Serhan, Ege, Ayranci, & Kosgeroglu (2012) reported women can also experience fatigue or irregular sleeping patterns. Nearly 20% of postpartum mothers experiencing baby blues will go on to develop postpartum depression (Zubaran et al., 2010).

Postpartum depression. Postpartum depression (PPD) is a significant health problem nationwide. In the United States, approximately “14-15% of women experience depression in the first 3 months after childbirth” (Hanusa et al., 2008, p. 586). In the state of Hawai‘i, one in every seven women (14.5%) with a recent live birth, were found to have self-reported postpartum depressive symptoms (Hayes et al., 2010). This translates to a yearly approximation of 3,000 new mothers at risk for PPD in Hawai‘i. Women in Hawai‘i with the highest scores were noted to be “Other Pacific Islander”, “Other Asian”, “Samoaan”, “Hawaiian”, “Filipino” and “Korean” (Hayes et al., 2010, p. 2).

There are have been several proposed causes for postpartum depression. Biological risk factors such as genetic, epigenetic, and endocrine dysregulations have been identified (Gaillard, Le Stat, Mandelbrot, Keïta, & Dubertret, 2014). Anemia, a very common complication that occurs in pregnancy and after is the depletion of red blood cells (Miller & MacDonald, 2011). This deficiency might be the contributing factor for ongoing fatigue and depression. Anemia can be treated with changes to the diet or with supplements of iron. In a small portion of cases, thyroid deficiency might contribute to postpartum depression. On occasion, the thyroid gland can be suppressed in pregnancy, altering mood and decreasing energy levels. In addition, a rapid decrease in estradiol and progesterone has been associated with PPD (Grabbe et al., 2012). Socio-demographic, psychosocial characteristics, and previous psychiatric history have also been linked to PPD.

Postpartum depression symptoms may start during pregnancy, requiring earlier screening and intervention. Grier & Geraghty (2015) defined PPD using the Diagnostic and Statistical Manual of Mental Disorders (DSM IV) “As a major depressive condition that occurs in the one year period following childbirth” (p. 110). Commonly, PPD occurs within the first three months postpartum, with the peak onset at four to six weeks. Women with PPD have symptoms that last at least two weeks, occur daily, and causes marked distress or impairment in functioning. These symptoms range from depressed mood, sleep impairments, anorexia, lack of pleasure, feelings of worthlessness, and suicidal ideation (Grabbe et al., 2012).

Psychosis. The final category is postpartum psychosis (PP). This can lead to maternal suicide or infanticide. Grabbe et al., (2012) stated that during the “First 30 days after birth, a woman is 21.7 times more likely to develop psychosis than in the 2-year period prior to childbirth” (n.p.). Approximately one in every 3,000 mothers develops PP (Miller & MacDonald, 2011). Women who are first time mothers are at greater risk than those with other children. Mental illness, previous history of PPD, and hormonal changes are identified as factors contributing to the development of PP. However, the exact cause of PP remains unclear. Symptoms of PP are characterized by erratic mood fluctuations, delirium, bizarre behavior and insomnia (Grabbe et al., 2012). The presence of visual or auditory, as well as tactile and olfactory hallucinations has been associated with PP. As a life threatening disorder, PP will commonly require hospitalization (Miller & MacDonald, 2011). Treatment may consist of antipsychotic medication in combination with antidepressant. Electroconvulsive therapy treatment is effective and fast acting for severe cases of PP. As a major health crisis, PP may lead to potentially fatal outcomes for the mother, infant, and family unit.

Risk factors. During pregnancy, obstetrical circumstances have been associated with PPD. The mode of delivery and levels of pain have been identified as contributing factors of PPD. Women who underwent an emergent C-section reported higher PPD scores at two months after delivery, however another study reported no correlation between delivery type and PPD (Gaillard et al., 2014). Pregnancy related complications such as premature labor, preeclampsia, and gestational diabetes increased the risk for the development of depressive symptoms (Katon, Russon, & Gavin, 2014). Unintended pregnancies have been suggested to influence the development of PPD. The presence of pain with or without an epidural had been reported to increase the incidence of maternal baby blues, however there was no correlation with PPD (Gaillard et al., 2014).

Women of all ages, ethnicities and various socio-economic backgrounds can be affected by PPD. Katon et al., (2014) identified younger, unemployed women and history of depression during pregnancy, as a high-risk group. Additional risk factors include pre-pregnancy medical conditions, lifestyle habits such as smoking and psychosocial stress. The highest risk factor identified in this study was depressive symptoms during pregnancy. Grier & Geraghty (2015) reported that positive indicators for the development of PPD include a history of depressive or anxiety disorders, lack of self-esteem, marital problems, lack of social support, and low socioeconomic status. Hayes et al. (2010) found women in Hawai'i with the highest self-reported postpartum depressive symptoms were younger women. These women were less educated, not married, on Medicaid/Quest insurance, had an unintended pregnancy, and reported intimate partner violence.

Problem

Kaiser Permanente (KP) Hawai'i implemented a new workflow process for PPD utilizing the Patient Health Questionnaire- 9 (PHQ-9) screening tool. In 2016, new guidelines by the American College of Obstetricians and Gynecologists (ACOG) recommended depression screening once during pregnancy, then repeated during the postnatal period (ACOG, 2015). The PHQ-9 is administered in pregnancy to women between 28 to 32 weeks gestation and repeated at approximately four to six weeks during the routine postpartum visit. However, women's attendance for this routine postpartum visit remains inconsistent. Staff compliance with PPD screening during the antepartum phase is variable, as standardized guidelines have not been established. The practice change for this project consisted of the implementation of an early depression-screening program in the SDP one to three days post hospital discharge. The SDP does not have a current practice for depression screening in this early postpartum period. This practice change aimed to result between two to three completed PHQ-9 screenings of women documented in their medical record, fulfilling the ACOG recommendations. This early depression-screening program involved earlier identification of postpartum depression symptoms and referral for further diagnostic evaluation for and prompt treatment of depression prior to the routine four to six week postpartum visit, thereby promoting maternal well being.

Practice question

Step 1: Recruit interprofessional team

The Kaiser Permanente (KP) SDP served as the clinical practice site for this DNP project. The staff is comprised of three Advanced Practice Registered Nurses (APRN), one registered nurse (RN), and one medical assistant (MA). The nurse manager for the SDP is a seasoned

pediatric nurse practitioner (PNP). Dr. Mariaailiana Stark and Janet Camacho served as the mentors for this DNP project. Dr. Stark has a PhD in childhood development, and is the director of the Kaiser pediatric developmental clinic. Janet Camacho, is a PNP and director of quality care at Kaiser Permanente. The external advisor and subject matter expert is Dr. Alexandra Sueda, a physician in Obstetrics and Gynecology (OBGYN). Dr. Sueda is the chief of OBGYN at the Kaiser Permanente Honolulu Clinic. Dr. Kent will be the IBH clinical psychologist liaison for this DNP project. The University of Hawai'i at Mānoa faculty chairperson is Dr. Maureen Shannon.

Step 2: Develop and refine the evidence based practice question

This DNP project utilized the, Problem, Intervention, Comparison Intervention and Outcome format, commonly known as the PICO statement (Newhouse et al., 2004). This format consisted of four aspects, the patient and or problem, intervention, comparison intervention and outcome.

P- Patient and/or Problem: Postpartum women in the SDP one to three days after hospital discharge. The problem is the lack of having had, or the missing documentation of, PPD screening in postpartum women, therefore missing potential identification and treatment PPD.

I- Intervention: Early PPD screening program

C- Comparison Intervention: Current Practice- no depression screening program in SDP.

O- Outcome: The outcomes included an increase in the percentage of postpartum women being screened using the PHQ-9 to 75%; increase the number of women screened and referred to IBH for PPD treatment by 5%; increase the attendance to the Kaiser Permanente support group

for PPD; and no increase in the SDP staff overtime throughout the three to four month implementation period.

The objectives of the early PPD screening program were to: a) initiate an early depression screening program in the SDP clinic: b) screen for PPD utilizing the PHQ-9 for all mothers attending the SDP clinic (specifically between one to three days after hospital discharge); c) provide quality monitoring of PHQ-9 scores at three data points- antepartum (third trimester), SDP clinic visit, and four to six week postpartum visit; and d) immediate referral to IBH for further diagnostic evaluation and treatment of women with a positive PHQ-9 screen.

Step 3: Define the scope of the evidence based practice question and identify the stakeholders

The scope of this DNP project targeted postpartum women one to three days after hospital discharge and subsequently routine four to six week postpartum visit. There were numerous stakeholders that were vital to this practice change. The first group of stakeholders impacted by this practice change consisted of the SDP and OBGYN staff as well as physicians in the outpatient clinic setting. The second group of stakeholders included the management team from the IBH, OBGYN, and SDP clinics. Our executive leadership team including the physician chiefs, vice president, and ambulatory nursing supervisors of the organization make up the final group of stakeholders. These leaders were provided with periodic updates of the progress of this QI project.

Step 4: Determine the responsibility for the project leadership

The leadership oversight for this DNP project was a joint effort between the SDP manager Ms. Mary Kawasaki and this DNP student. This was necessary due the complexity of

the practice change. Ms. Kawasaki was responsible for the SDP workflow, financial analysis of the budget, and the medical chart reviews. This DNP student facilitated all of the participating departments and provided direct oversight of the project. As a team, the co-leads worked collaboratively with the multidisciplinary team to guide this practice change.

Step 5: Schedule team meeting

Monthly telephone or in-person meetings were held with the SDP staff, mentors, external advisor and UHM DNP committee chair. As the implementation phase approached, the frequency of the team meetings increased to bimonthly. An initial meeting with the IBH service reviewed the workflow, referral process, and emergency assistance guidelines was completed with Dr. Kent, the clinical psychologist at IBH. This QI project was reviewed by the research determination official on behalf of KP and declared as not research. Therefore, this project did not require review by the KP Institutional Review Board. Ongoing weekly meetings with the SDP manger facilitated the proposed workflow process. Monthly meetings with the physician chief of OBGYN continued throughout the duration of this project.

Evidence

Step 6: Conduct internal and external search for evidence

A literature search was conducted for evidence based reports on: 1) maternal postpartum depression screening; 2) predictors of postpartum depression and the impacts; 3) paternal postpartum depression and prevalence; 4) maternity baby blues and postpartum depression; and 5) PPD interventions and management (see Appendix A). Initially, an internal search of KP Hawai'i references determined current recommendations for PPD screening uncovered two expert committee reports that assisted to create the current clinical practice guidelines for the

region. A team of KP physicians in the OBGYN department established these committee reports. The committee members recommended a validated tool for PPD screening and the appropriate timeframe for screening. Subsequently, databases for the external search of evidence included PubMed, CINAHL, Cochrane Library, National Guideline Clearinghouse, and MEDLINE. Key words or terms in this search included “depression postpartum, screening tools for postpartum depression, paternal, maternal or parental postpartum depression, maternity baby blues, predictors of postpartum depression, and postpartum management”.

In order to obtain the current evidence based information, the search criteria was restricted to articles published within the past five years, starting from 2010. Other inclusion criterion was English language only, female participants, and PPD versus generalized depressive symptoms not occurring after childbirth. A total of 33 articles were not included because 10 articles were in another language other than English, 11 articles failed to implement a validated depression-screening tool, and 12 articles focused on paternal PPD. The final 11 articles that were excluded focused on the correlation between PPD and the impact on childhood development. The entire search resulted in a total of 250 publications from 2004 to 2016 that were identified and then examined. These were further narrowed down, and 53 articles were utilized for the purposes of this review (see Appendix A). Two committee reports were utilized for this literature review, one from the Scottish Intercollegiate Guidelines Network (SIGN) along with the ACOG report were used in this literature review.

Step 7: Appraise the level and quality of each piece of evidence

The Mosby’s Quality of Evidence was utilized to grade the level of evidence and the internal validity (Melnik, 2004). This rating system is used in Evidence-Based Practice (EBP)

to grade the quality of the studies in the literature synthesis. This grading system assigns each study to one of eight levels with level 8 reserved for “Other” published articles including performance improvement and review of literature studies. The synthesized reports are ranked according to the eight levels of evidence as presented (see Table 1).

The Level I evidence represents studies that are meta-analyses or systematic reviews (Melnyk, 2004). This current literature review did not locate any meta-analysis relevant to this topic. The Level II evidence includes experimental design studies, including randomized controlled trials (RCT). There were six studies found to represent this category of evidence. The Level III evidence classifies the quasi-experimental design studies, of which only one study was identified by this literature search. The Level IV evidence includes case controlled, cohort studies and longitudinal studies. This level of evidence represented the majority of the studies in the search, a total of 21 studies were incorporated into this literature review. The Level V evidence is the correlational design and two articles were utilized for this review. The Level VI evidence comprises a variety of descriptive studies: surveys, cross-sectional, developmental and qualitative designs. A combination of 13 descriptive studies was included in this literature review. The Level VII represents authority reports or committee opinions. In this review, two committee reports were applicable. The eighth level is an “Other” category that consists of eight studies pertinent to this literature review.

Table 1

Literature review results

Level of evidence	Description	Number of articles
Level I	Meta-analysis	0
Level II	Experimental & RCT	6
Level III	Quasi-experimental design	1
Level IV	Case controlled, cohort & longitudinal studies	21
Level V	Correlational Studies	2
Level VI	Surveys, cross-sectional design, developmental design, & qualitative studies	13
Level VII	Authority opinion & expert committee reports	2
Other	Performance Improvement & Review of Literature	8

Note. Mosby's level of evidence was applied for this literature review. Key search terms were depression postpartum, screening tools for postpartum depression, paternal, maternal or parental postpartum depression, maternity baby blues, predictors of postpartum depression, and postpartum management.

Step 8: Summarize the individual evidence

Screening for PPD. There were several validated screening tools available for surveillance of PPD. One commonly utilized screening tool is the Edinburgh Postnatal Depression Scale (EPDS). Several studies confirmed the validation of the EPDS for PPD screening a sensitivity of 59% to 100% and a specificity of 49% to 100% (Flynn et al., 2011, Level VI; ACOG, 2015, Level VII; Martins Cde et al., 2015, Level VI; Matijasevich et al., 2014,

Level VI). Jardri et al., (2006) stated screening on the fifth day postpartum with the EPDS correlated to scores obtained when an EPDS screening is performed at six weeks postpartum. This study validated the use of the EPDS early during the postpartum period, specifically between postpartum days three and five.

Another commonly utilized screening tool for PPD was the PHQ-9. Several studies validated the PHQ-9, reporting a sensitivity of 75% and a specificity of 90% (Flynn et al., 2011, Level VI; Gjerdingen, Crow, McGovern, Miner, & Center, 2009; ACOG, 2015; Hanusa et al., 2008). One article validated the simplified version, the Patient Health Questionnaire-2 (PHQ-2), reporting sensitivity rates at 100% and a specificity of 44% (Gjerdingen et al., 2009, Level II). These authors similarly reported the PHQ-9 as a feasible, time efficient, and applicable to a community health center or primary care clinic. The most common timeframe for postpartum depression screening occurred between four to twelve weeks after delivery (Hanna, Jarman, Savage, & Layton, 2004, Level VI; Hanusa et al., 2008, Level V). One article highly recommended screening between three to five days postpartum rather than six weeks postpartum (Jardri et al., 2006, Level II). Several studies implemented the PHQ-9 between six weeks to six months postpartum; however, all three studies reported consistent results with identifying a major depressive episode (ACOG, 2015, Level VII; Hanusa et al., 2008, Level V). The women who scored higher than nine on the PHQ-9 on postpartum day five, were eight times more likely to score nine or greater at six weeks postpartum. These results were a positive predictor of maternity baby blues and mothers at risk for PPD (Petrozzi & Gagliardi, 2013, Level IV; Zubaran et al., 2010, Level Other).

One study suggested a multi-disciplinary team approach to PPD is necessary as a tertiary preventive measure (Jardri et al., 2006, Level II). Another concluded that women with PPD symptoms have suboptimal attendance for postpartum follow up visits (Tsai, Nakashima, Yamamoto, Ngo, & Kaneshiro, 2011, Level IV).

Interventions for PPD. Several studies attempted to correlate a specific intervention to decreasing the incidence of PPD. A telephone-based support model showed a significant reduction in PPD symptoms and EPDS scores between the intervention and control groups (Lavender, Richens, Milan, Smyth, & Dowswell, 2013, Level Other; Shamschiri Milani, Azagashb, Beyraghi,, Defaie, & Asbaghi, 2015, Level II). Two studies reported a minimal decrease in PPD when an educational or counseling intervention was added to the usual postpartum care (Dennis & Dowswell, 2013, Level Other; Tsai et al., 2011, Level IV). One study reported no change in PPD when home visits were incorporated early after hospital delivery as part of the routine postpartum care (Yonemoto, Dowswell, Nagai, & Mori, 2013, Level Other).

Step 9: Synthesize overall strength and quality of evidence

The overall quality of evidence from this literature review was consistently good. There were a total of seven articles that fell into the evidence categories of level II and III. However, the majority of the articles in this review were classified to be in the level IV category. While the quality of these studies was good, there were several that produced conflicting results. First, the screening timeframe during pregnancy and the postnatal period were variable throughout these studies. The recommendations of depression screening during pregnancy were suggested between six to eight months. During the postpartum period, consistent recommendations for

evaluation of PPD were between four to twelve weeks postpartum. Second, there was inconsistency with the use of screening tools that were administered to evaluate PPD, specifically different studies used different screening tools. Finally, there were inconsistencies with the validation of the depression scores.

There were thirteen level VI evidence studies that demonstrated consistent results. These descriptive studies provided further details about PPD screening that were applicable to this project. These studies provided insight about PPD, the contributing risk factors, and resulting effects of PPD. This background was imperative to grasp a complete understanding of PPD.

There were two level VII evidence studies by expert committees from reputable organizations, both with credible recommendations and which were applicable to this project. The first committee report by ACOG suggested implementation of a validated screening tool at least once during pregnancy and again during the postnatal period (ACOG, 2015). Another report by the Scottish Intercollegiate Guidelines Network (SIGN) suggested screening for depression a minimum of once during pregnancy, and at four to six weeks and again three to four months during the postnatal period (SIGN, 2012). These committee reports are from reputable organizations and appropriate to the proposed project.

Limitations

There were several gaps in the literature identified and limitations to many of these studies. The most commonly utilized screening tools are the EPDS and the PHQ-9 (Flynn et al., 2011). Both of these tools can be used in men and women, however limited studies are available regarding the validity of their use to determine depressive symptoms in the adolescent population. Logsdon & Myers (2010) stated adolescents experiencing psychological difficulty

were underestimated when screened for PPD with the EPDS. The EPDS screening tool behaves differently in adolescents versus adults, and lower cutoff scores may be warranted (Logsdon & Myers, 2010). Further evaluation on cutoff scores, screening timeframe, and risk factors remain unknown in the adolescent population.

There are several studies that evaluated the adverse effects of maternal PPD; however, the prevalence of paternal PPD and its impact on maternal PPD has not been adequately investigated (Anding, Rohrle, Grieshop, Schucking, & Christiansen, 2015). The EPDS is a validated screening tool for paternal postpartum depression. The EPDS has a sensitivity of 81.8% and specificity of 94.1% among (Nishimura, Fujita, Katsuta, Ishihara, & Ohashi, 2015). The prevalence of paternal postpartum depression one month after childbirth was estimated at 11.6%, increasing to 16.3% at 6 months and 19.4% at the 12 months after childbirth (Nishimura et al., 2015). The effects of paternal postpartum depression have been reported to negatively impact the emotional and behavioral development of the child.

The last gap amongst these studies indicated a need for further research related to the prevention of PPD and the interventions that could possibly reduce PPD rates. Dennis & Dowswell (2013) stated, “Women who received a psychosocial or psychological intervention were significantly less likely to develop postpartum depression compared with those receiving standard care” (p. 2). These interventions consisted of postpartum home visits by midwives or public health nurses; peer telephone based support system; and interpersonal psychotherapy. For example, Anding et al., (2015) found that mothers with elevated EPDS scores indicating PPD made additional midwife contacts in the intervention versus the control group; however, the long-term benefits of these contacts could not be concluded. Lavender et al., (2013) reported the

results were inconsistent and insufficient to recommend a routine telephone support system. However, the results demonstrated reduced depression scores and increased overall satisfaction rates among mothers. These studies addressed the gap in the current evidence and the need for further longitudinal studies on PPD.

Sampling limitations included small sample sizes, high drop out rates, and lack of diversity amongst participants were commonly reported (Anding et al., 2015). In a study by Hanusa et al., (2008) the sample consisted of only women with positive results as “This method of interviewing only women with high symptoms is widely used and cost-effective” (p. 594). Studies reported findings might not be applicable to the general population due to the sample limitations, which included health status and ethnicity (Flynn et al., 2011). In addition, several studies performed at a single site or geographical region (Katon et al., 2014). Multiple articles evaluated a specific screening tool for PPD, however these instruments are all self-reporting tools, thus may overestimate the rate of PPD (Gaillard et al., 2014). Howell et al. (2014) noted screening instruments are commonly utilized versus formal structured interviews to diagnose depression. The final limitation was the study design lack of control group, randomization, and relationship between the variables evaluated (Banti et al., 2011).

Step 10: Develop recommendations for change based on evidence synthesis

Screening tool. Based on this literature synthesis, the first recommendation was to use a validated instrument, either the EPDS or the PHQ-9. Both screening instruments are valid, feasible, and time efficient in the primary care setting. Currently, KP utilizes the PHQ-9 in clinical practice throughout the primary care outpatient clinics. Based on the PHQ-9 score, practitioners refer to the KP Hawai‘i Depression Management Guidelines to provide appropriate

follow up care (Kaiser Permanente, 2012). Commonly, a self-referral is generated to the IBH department for diagnostic and evaluation for treatment of depression. As a result, the PHQ-9 was the screening instrument utilized for this DNP project.

When a PHQ-9 score of less than five is detected, this indicates low risk, in which the patient was given anticipatory guidance (Kaiser Permanente, 2012). A PHQ-9 score of five to nine reflects mild depressive symptoms, requiring education with anticipatory guidance to be provided (see Appendix B). In addition, IBH resources were discussed and a telephone follow-up was scheduled to repeat the PHQ-9 in two weeks by the SDP APRN. If a PHQ-9 score between 10 and 14 was detected, this suggests moderate depressive symptoms, requiring education and anticipatory guidance. Again, IBH resources were discussed and a telephone follow-up was scheduled to repeat the PHQ-9 in two weeks by the SDP APRN.

When the PHQ-9 score of 15 or greater is detected, this implies moderately to severe depressive symptoms. During the weekdays, if a woman had a score of 15 or greater, the APRN was to notify the IBH provider in the facility for an immediate face-to-face consultation with the women following the completion of the newborn visit. For weekend assistance, the mother was to be escorted to the after hours care clinic for an immediate medical evaluation by a physician. For a PHQ-9 score of 20 and greater, this signifies severe depressive symptoms. Urgent action by the APRN to get an available IBH provider for immediate consultation was to be initiated. For weekends, the on-call psychiatrist was to be notified via pager to discuss triage with transfer to the KP Moanalua Emergency Room. For all scores of 15 or greater, IBH was to be responsible for the diagnosis and treatment plan as well as future services. For all PHQ-9 scores

of 5 or greater detected at the SDP visit, the patient's chart was to be forwarded to the primary OBYGN provider.

Multi-disciplinary team. The second recommendation was to create a multi-disciplinary team to address PPD (ACOG, 2015; Jardri et al., 2006). This team consisted of physicians, nurses, social workers and behavioral specialists. In the KP organization, prior to the initiation of this DNP project, there was no multi-disciplinary team to focus on PPD; however, such a team could provide comprehensive PPD care that addresses all facets related to screening, treatment and follow-up. The interdisciplinary team for this project was responsible for providing recommendations about and facilitate PPD treatment for women in the KP Hawai'i region.

Risk factors. The identification of mothers at high risk for PPD included assessing risk factors for the development of this condition. These risk factors include previous PPD, mental health concerns, unemployment, marital discord, and/or inadequate social support (Jardri et al., 2006; Morikawa et al., 2015; Stone et al., 2015). However, women's life circumstance can change and, therefore, having screening for PPD only once during pregnancy and the postpartum period can result in missing those women whose mental health status has changed. Therefore, implementing PPD screening during pregnancy and repeated PPD screening at regular intervals during the postpartum period when PPD are most likely to manifest can improve the identification and treatment rates for this group.

Innovation and objectives. The implementation of the four key principles recommended in the literature was intended to be congruent with the organizations present climate and culture. The first objective was the implementation of a validated screening tool for

PPD. The preferred screening tool selected by KP for this project is the PHQ-9. The second objective was the integration of an early postpartum depression-screening program. As noted previously, screening is recommended soon after delivery; however, manifestations of PPD may occur with the first three months, with a peak onset of four to six weeks (Jardri et al., 2006; Tsai et al., 2011). The third objective was to provide quality monitoring of depression over the course of the antepartum and postnatal period. This portion included a longitudinal assessment and comparison of PHQ-9 scores, from a screening completed during pregnancy with two to three screening points during the first three months postpartum. The final objective was an early intervention and treatment for PPD. This will include an immediate referral to IBH if the PHQ-9 scores are ten and greater, based on current KP depression management guidelines.

Summary

PPD is a local and national problem that is multifactorial. This project aimed to change the way PPD is screened in the outpatient setting at Kaiser Permanente. The implementation of the PHQ-9 in this early postpartum depression-screening program aimed to detect and provide early treatment for PPD. The monitoring of PHQ-9 scores from pregnancy to the postpartum period is essential in detecting PPD and establishing a correlation between scores. The interdisciplinary team for this project intended to diagnose PPD symptoms and provide early patient centered care. In partnership with IBH, the goal was to reduce the negative impact associated with PPD for the mother, newborn, and family unit.

Chapter two identified the problem and evaluated the literature that supported this DNP practice change. The objectives for this project were created based on the literature search recommendations. The John Hopkins's Evidence Based Practice model was utilized throughout

this practice change as the conceptual framework. The first ten steps of this model have been addressed in this chapter with the last eight steps presented in the remaining chapters. A multidisciplinary team was established and the co-leaders identified.

CHAPTER 3. METHODS

Chapter three presents the methods for implementing the Doctorate of Nursing Practice (DNP) project. The John Hopkins Evidence-Based Practice Model was used to guide this clinical practice change (Newhouse et al., 2004). Step 12 emphasizes the creation of an action plan for the project. The objectives of the project, design, and proposed practice change are inclusive. Step 13 initiates the implementation of the practice change and defines the conceptual as well as operational definitions. The sampling plan and data collection processes are detailed in this section. Step 14 evaluated the outcomes, including an evaluation of the plan and the incorporation of data analysis.

Step 11: Determine fit, feasibility, and appropriateness of recommendation (s) for translation path

Relative advantage. The focus of this DNP project was an early postpartum depression (PPD) screening program. Screening for PPD during the early newborn visits (i.e. within one to three days post hospital discharge) does not currently exist at the Kaiser Permanente (KP) Special Delivery Program. The Patient Health Questionnaire-9 (PHQ-9) is the screening tool that will be utilized because this is a valid depression screening tool (e.g., sensitivity of 75%, specificity of 90% (Flynn et al., 2001) preferred by the KP Hawai'i region. Staff members were trained to implement and document the results in the electronic medical record (EMR). Prior knowledge and experience with the EMR by staff increased the efficiency. Initiating the PHQ-9 did not require additional manpower, copyright fees, or supplies. Additional time for the advance practice registered nurse (APRN) was required for PHQ-9 scores of five and greater, because this indicated mild depressive symptoms that required further evaluation. Regional KP

depression management guidelines for positive PHQ-9 screenings are currently in place and established by the KP IBH department (Kaiser Permanente, 2012). These practice guidelines assisted practitioners to appropriately manage patients with varying degrees of depression.

The American College of Obstetricians and Gynecologists recommended depression screening once during pregnancy and repeated during the postpartum period (ACOG, 2015). A brief review of the medical record of patients' charts to determine depression screening during the antepartum period at KP Hawai'i determined that the screening of pregnancy women has been inconsistent. Therefore, pregnant women are at risk for having undetected depression. After delivery, if a mother fails to attend the routine postpartum visit between four and six weeks after birth, screening for PPD will also be deficient, further contributing to undetected depression that may be untreated leading to increased severity of the condition (including postpartum psychosis). Conducting a PPD screening using the PHQ-9 soon after delivery may bridge the identified gap in perinatal depression screening.

According to Rogers (2003), "Preventive innovation is a new idea that an individual adopts now in order to lower the probability" (p. 234). Since this was a preventive innovation, the reward and advantages may not necessarily be immediate. This program was a new process to SDP, resulting in some initial apprehension. With the initiation of this new workflow process, confidence and comfort levels significantly increased over time. A piloting period was beneficial for staff to gain experience with the proposed workflow and to identify barriers in the large-scale implementation for this practice change. A positive PHQ-9 screening and referral to IBH served as a reward to staff and practitioners.

Compatibility. Currently, the KP Hawai‘i region implements the PHQ-9 screening tool in many outpatient care facilities. These locations include women’s health departments, primary care, and specialty clinics. The implementation of the PHQ-9 in the SDP was a new practice; however, the staff is familiar with and trained to use this screening tool. The KP Depression management guidelines were established by the IBH in 2012 based on PHQ-9 scores (Kaiser Permanente, 2012). These practice guidelines assist practitioners with recommended treatment and follow up based on the PHQ-9 scores. This new practice change of implementing the PHQ-9 was very simple and straightforward for the KP staff. The SDP visit incorporates couplet care (i.e., maternal and infant care), giving the practitioner time to educate mothers on PPD. The APRNs provided anticipatory guidance with available resources for assistance. This project workflow process was highly compatible with the functionality of the SDP unit.

Complexity. The implementation of this practice change was moderate in complexity. The SDP staff needed a solid foundation to understand the symptoms, risks, and benefits of PPD. An easy to follow algorithm assisted staff members regarding the workflow for this project (see Appendix B). The purpose of this newborn visit was to transition from infant care to couplet care, mother and baby. The APRN was responsible for providing education to patients and their families on PPD. Most importantly, the APRNs were required to encourage treatment based on the KP depression management guidelines (Kaiser Permanente, 2012). The SDP staff completed a training session on the PHQ-9, which minimized barriers to the new workflow process.

Trialability. Many components to the new workflow process were available in the Kaiser organization. These include: a) the staff is trained on the PHQ-9; b) copies of the PHQ-9 are available; c) the EMR has been upgraded for PHQ-9 documentation; and d) IBH has a

depression management guidelines are in place. Once the staff completed the project training, the pilot testing for one week was initiated. During the trial period, staff reported barriers and actively participated to improve the workflow process. As the workflow developed, staff assisted with increasing efficiency throughout the implementation phase. This ongoing evaluation process proved to be a critical aspect to finalizing the workflow process.

Observability. This project was preventative innovation, since the results were not immediately observable or visible to staff. The aim of this depression-screening program was to identify PPD symptoms early and activate treatment. The proposed implementation timeframe was approximately three months. The expected number of newborns scheduled at the KP SDP was approximately 300-350 newborns (Ater, 2016). This was anticipated to result in a sample population of approximately 300-350 women who would have completed PHQ-9 scores at three data points- antepartum (third trimester), SDP clinic visit (one to three days after hospital discharge), and at the four to six week postpartum visit. A study by Hayes, et al., (2010) stated PPD in the state of Hawai‘i occurs in one in every seven women or 14.5% of all live births. Based on the volume of patients and local prevalence rates, this project anticipated about 40 mothers to have a positive PHQ-9 score during the postpartum timeframe noted for this DNP project.

Sustainment. This proposed practice change has the ability to make a large impact on this population and throughout the KP Hawai‘i region. As an organization, KP is committed to provide affordable care, personal, and trustworthy (Kaiser Foundation Hospital, 2013). This early screening program was an extension of care initiated throughout pregnancy. The potential benefit to the patient, infant, and family unit this screening program offered was and remains

promising. There were no additional costs and the productivity of the APRN remained neutral. SDP was the ideal clinical setting to have initiated and sustained a program of this nature, due to the large education component embedded in the newborn visit. The seasoned SDP staff and manageable patient population allowed the APRNs ample time to thoroughly educate families. Ongoing feedback, reporting results to staff, and evaluating the process continued to keep the program thriving. This early screening program is sustainable and effective for future years.

Step 12: Create an action plan

Screening for PPD at KP is performed once during pregnancy and repeated at the four to six week postpartum visit. The SDP visit soon after delivery bridged this care gap for the mother and baby. The SDP department includes three APRNs providing newborn care and lactation support seven days a week. Early screening within one to three days after hospital discharge is essential to activate necessary treatment services for women experiencing symptoms of PPD.

The PHQ-9 was the standardized screening tool utilized by KP Hawai'i region to assess for depression. Positive screening on the PHQ-9 is indicated with a score of five or greater, suggesting mild depression. This score indicates a repeat screening of the PHQ-9 via telephone in two weeks, anticipatory guidance, and self-referral to the IBH for treatment. Chapter three incorporated the John Hopkins Evidence-Based Practice model, which created evidence-based standards, related to PPD. The focus evaluated the proposed target population, procedures, and data collection methods implemented throughout this DNP project.

Objective. The evidence-based question for this DNP project was formulated by utilizing the PICO approach (Newhouse et al., 2004). This format consists of the patient and or problem, intervention, comparison intervention and outcome.

P- Patient and/or Problem: Postpartum women attending the SDP clinic one to three days post hospital discharge. The problem is the lack of, or the missing of the screening of postpartum women, therefor missing potential diagnosis of PPD.

I- Intervention: Early depression screening program

C- Comparison Intervention: Current Practice- no depression screening program in SDP clinic.

O- Outcome: Increase the number of women screened and referred to IBH for PPD evaluation and treatment by 5%. No increase in the SDP staff overtime throughout the three to four month implementation period. Increase the attendance to the KP support group for PPD. Finally, increase the percentage of postpartum women screened one to three days post hospital discharge to 75% utilizing the PHQ-9 screening tool.

The objectives of the early PPD screening program were to: a) initiate an early depression screening program in the SDP; b) screen for PPD utilizing the PHQ-9 for all mothers attending the SDP clinic; c) provide quality monitoring of PHQ-9 scores at three data points, antepartum (third trimester), SDP clinic visit (one to three days post hospital discharge), and postpartum (four to six weeks after birth); d) immediate referral to activate further evaluation and treatment with IBH for PHQ-9 positive screenings.

Step 13: Implement the change

The design of this DNP project was an evidence-based practice design. According to Newhouse et al. (2004), there are three main structures, the practice question, evidence and translation process. A clinical question is formulated based on the selected patient care setting. The care gaps or process improvement areas were identified with the practice question

formulated. The scope of the problem includes the background and environment description. When the specific practice question is developed, the anticipated outcomes are examined. The next step included a thorough evaluation of the evidence. This process included a “Critical analysis, synthesis, and interpretation of evidence are made explicit by the use of rating scales” (p.24). The final phase was the translation segment, which included interpreting the evidence and applying this into clinical practice suitable for the selected clinical practice setting.

Practice change description. Screening for PPD at KP is performed once during pregnancy and repeated at the four to six week postpartum visit in all OBGYN outpatient clinics. The SDP newborn visit soon after delivery bridged this care gap for mother and baby. The SDP department is comprised of three APRNs providing newborn care and lactation support seven days a week. During this SDP visit, depression screening was previously not assessed. Early screening is essential to activate necessary treatment services for women experiencing symptoms of PPD. The purpose of this DNP project was to provide early PPD screening by using the PHQ-9 one to three days post hospital discharge.

Education. The first section of this practice change was to educate the SDP staff and manager on PPD. During each staff meeting, team members received an overview of the project with the etiology of PPD. An algorithm provided a visual description of the proposed workflow changes that assisted with implementation. The administration and documentation of the PHQ-9 in the EMR was reviewed. A sample PHQ-9 was given to each staff member to demonstrate scoring competency. The role and expectations of the APRN were thoroughly discussed. The IBH providers assisted to guide the SDP staff on the referral process, depression management guidelines, and support services.

Process. Prior to discharge from KP Moanalua Hospital, all infants are scheduled for a newborn visit with SDP clinic one to three days after discharge. This initial visit consists of a complete physical exam, jaundice assessment, and lactation evaluation by an APRN. The newborn is commonly accompanied by the mother or with both parents. The APRN discusses the importance of having screening done with each mother, then requests each mother to complete the PHQ-9 screening tool alone in the examination room. Once completed, the results were documented in the patient's medical record. The APRN reviews and compared the scores from the antepartum screening to the SDP visit.

Utilizing the KP depression management guidelines, scores four and less on the PHQ-9 indicated low risk (Kaiser Permanente, 2012). The mother received anticipatory guidance with a list of resources by the APRN. If a PHQ-9 score of five to nine, mild depressive symptoms were suggested, warranting education and self-referral to IBH. The APRN reviewed the IBH resources and available treatment services. A follow-up telephone visit was scheduled to repeat the PHQ-9 within two weeks by an APRN. If a score of ten or greater was detected, moderate depressive symptoms was implied. A self-referral to IBH was initiated. A PHQ-9 was to be repeated by IBH within two weeks with anticipatory guidance provided. A score of 15 or greater demonstrated moderately severe depressive symptoms. The APRN notified an IBH provider in the facility for a consultation following the completion of the newborn visit. For PHQ-9 scores 20 or greater, this signified severe depressive symptoms. Urgent action by the APRN to get an available IBH provider for immediate consultation is initiated. For all scores of 15 or greater, the IBH were responsible for developing the evaluation and treatment plan including future services. At the completion of the SDP visit, the delegated OBGYN physician received notification from

the APRN of patients with a PHQ-9 score of five and greater. To assist the SDP staff and APRNs with the new workflow for this project, an illustrated flowchart was created (see Appendix B).

Outcomes. There were four short-term outcomes that were applied to this DNP project. The first outcome was to screen approximately 75% of the mothers that attended the SDP utilizing the PHQ-9. The second outcome was to increase the number of women screened and referred to IBH for PPD treatment by five percent. The third outcome was to demonstrate no increase in the SDP staff overtime throughout the implementation period, thus keeping the project cost neutral. The fourth outcome was to create and increase the attendance to the KP support group for PPD.

Definitions. Postpartum depression (PPD) is defined in the “Diagnostic and Statistical Manual of Mental Disorders (DSM IV) as a major depressive condition that occurs in the one year period following childbirth” (Grier & Geraghty, 2015, p. 110). After delivery, women with PPD experience feelings of sadness, loneliness, or inadequacies daily for at least two weeks. Additional symptoms include erratic sleep patterns, anxiety, or the inability to care for oneself or the newborn infant.

For this project, PPD was assessed in the SDP utilizing a screening tool, the PHQ-9. This standardized self-reporting screening tool is validated for the assessment of postpartum depressive symptoms. There are a total of nine questions, with scores ranging from zero to a maximum score of twenty-seven. For all PHQ-9 scores of five to nine, this indicated mild depression and patients received a self-referral to IBH services by the APRN (Kaiser Permanente, 2012). A telephone follow-up call was scheduled in two weeks to repeat the PHQ-9

score by the APRN. For scores 10 or greater, this correlated to the KP depression management guidelines, which indicated moderate depression. For PHQ-9 scores of 15 to 19, this indicated moderately severe depressive symptoms and greater than 20 suggested severe depressive symptoms. All scores of five and greater generated a self-referral by the APRN for treatment services to the IBH. This department specializes in treatment, counseling and pharmacological services of all mental health issues. In addition to the referral, scores of 15 or greater received an immediate face-to-face consultation to an IBH provider prior to discharge from the SDP clinic to assure safety.

Sampling plan

Setting. The KP organization is one of the largest integrated health care delivery systems in the United States. This not-for-profit organization resides in eight different regions, “Northern and Southern California, Hawai‘i, Colorado, Georgia, the Mid-Atlantic States, Ohio, and the Northwest” (McCarthy, Mueller, & Wrenn, 2009, p. 2). The KP provides care for more than 8.6 million members, with a workforce of approximately 167,000 employees and 14,600 physicians. The mission is to “Provide affordable, high-quality health care services to improve the health of our members and the communities we serve” (McCarthy et al., 2009, p. 2). The KP organization is comprised of three separate entities: Kaiser Foundation Health Plan (KFHP), Kaiser Foundation Hospitals (KFH), and the Permanente Medical Groups. All three individual entities work interdependently within one another. Utilizing a closed group model of care, all KP members are serviced by KP providers, unless outside the covered areas.

The KP Hawai‘i region services approximately 229,000 members throughout the state of Hawai‘i (Kaiser Foundation Hospital, 2013). The KP organization has 18 outpatient clinics

providing primary care, specialty services, and urgent care services on four islands. There are three major hospitals located on O‘ahu and Maui. The primary site for this DNP project was the KP Mapunapuna and Moanalua outpatient clinics. Prior to this DNP project, the SDP did not screen for postpartum depression. The SDP staff is comprised of three APRNs, one registered nurse, and one medical assistant. The SDP manager, Mary Kawasaki was an APRN and actively participated throughout this project.

Sample. The SDP department focused on newborn care and lactation services, seven days per week to all KP members less than eight days old. The visits were approximately 30 minutes in length and scheduled one to three days after hospital discharge. Most newborns were commonly accompanied by their mothers the SDP appointment.

The targeted population for this DNP project was postpartum women one to three days post hospital discharge. The accessible sample was mothers attending the SDP appointment with their newborn infant. The sample size for this DNP project aimed for approximately 300 to 350 patients over a three to four month period (Ater, 2016). The anticipated sample size was based on quarterly SDP census data. The figures varied due to high peak seasons during the summer and winter months.

Inclusion and exclusion criteria. The first inclusion criterion for this DNP project required all participants to have KP health plan insurance. This ensured appropriate referrals, ongoing data trends, and compliance with KP regulations. The second criterion was the mother had delivered an infant either via vaginal birth or C-section and intended to keep the newborn. Finally, all infants were less than eight days old to meet the SDP guidelines for an appointment. Therefore all participants had the SDP visit less than eight days postpartum at the time of the

screening. Participants of any age, having delivered an infant, and intended to keep the infant were included in this sample. Data collection of the sample included gestational age, gravida, parity, mother's age, and type of delivery was collected. Previous history of any medical or psychiatric conditions were not screened or excluded. The exclusion criteria for this DNP project included mothers who were surrogates, were moving out of state, or were in the process of adopting an infant, were therefore excluded from the sample.

Communication processes. The first goal was to gain credibility for this QI project was to have an opinion leader. This individual assisted to encourage behavior changes amongst the SDP, OBGYN, and IBH staff. The SDP manager volunteered for this leadership position. As an experienced leader, Mary Kawasaki was the ideal candidate. She assisted with the recruitment of supporters, provided feedback during implementation, and outreached to providers. This DNP student was the change agent and subject matter expert. The change agent provided empathy, knowledge, and expert communication skills to all staff members. The primary focus for both leaders was to motivate and convince staff members, especially the laggards to support this practice change.

The first platform to outreach awareness and generate support was the pregnancy centering groups. This group visit model consisted of one provider that facilitated a group of eight to ten pregnant women. The group visits were two-hour long appointments scheduled according to the mothers expected due date. An exam was performed during the visit with active group discussion based on the patient preferences. The aim was to initiate an interpersonal channel that targeted a large population of women. This brief educational session during the third trimester was the ideal timeframe for these pregnant mothers. The teaching session

included an overview of PPD, the symptoms, screening tools, and available resources in the region. The next strategy this practice change benefitted from was mass media. This assisted to spread awareness to all KP employees. A short summary that detailed the innovative practice change on PPD was available on the KP intranet. Visual reminders of the practice change included handouts and posters in the SDP, the OBGYN, and the IBH department provided visual reminders of the importance of PPD.

User of innovation. The first user of this innovation was the SDP staff. The staff was classified as early majority, as they did not lead, however were willing to go along with the practice change. The next user was the SDP manager, Mary Kawasaki. As an early adopter, she continued to persuade the staff and physicians on the benefits as well as importance of the program. The next user was the IBH department, which was classified as laggards. Upon learning about the details of the program, the feedback from the IBH was negative, which illustrated a resistance to this change. The next user of this innovation was the OBGYN staff. This department was classified as a late majority. The staff expressed uncertainty over the proposed practice change. The practice change did not impact workflows in the OBGYN department; the aim was to educate the staff on the importance of PPD. The final user was the Kaiser Permanente leadership team. The executive leadership team was a late majority user, since this group was undecided and followed the recommendations of the medical providers.

Recruitment and marketing plan. This screening program was a new process to the SDP. First, the meeting with the executive leadership team and OBGYN physicians was the initial step, which assisted to gain momentum. This brief informational session, handouts and posters were distributed to provide visual illustrations of the early depression-screening program.

A large poster presentation board at the SDP clinic was displayed to provide staff and patients with an overview. The next step was a monthly face-to-face meeting with the SDP, OBGYN, and IBH staff that demonstrated a presence. This allowed staff to voice feedback and concerns of the workflow process. The goal was to develop and continue an interpersonal relationship with the staff members that participated in this practice change. Finally, the KP intranet provided detailed information about the screening process prior to implementation. The intent was to notify all KP employees throughout the region of the QI project.

Data collection

Procedures. Following the delivery of the newborn, the infant was observed for 24 to 48 hours on the Mother Baby Unit at KP Moanalua Hospital. A discharge appointment was scheduled for all newborns with the SDP one to three days after hospital discharge. Once the appointment was secured, the APRN from the SDP simultaneously scheduled the mother for a documentation visit at the same time as the infant. This visit allowed the APRN to document the PHQ-9 screening results. At the scheduled visit, patients checked in at the centralized registration desk of the outpatient clinic. The SDP was located on Monday to Friday at the Mapunapuna Clinic and on weekends at the KP Moanalua Specialty Clinic. Immediately after check-in, the APRN was notified via the electronic medical record of the time of arrival. The APRN escorted only the mother and newborn into the exam room. The APRN instructed the mother with verbal instructions on the PHQ-9 questionnaire and rationale for implementation. Using a laminated PHQ-9 screening tool and erasable marker, the mother answered the entirety of the PHQ-9 as the APRN completed the intake vital signs of the newborn.

Once completed, the APRN scored and documented the results into the mother's chart in the EMR. The APRN reviewed the results with the mother and proceeded according to the KP Depression Management (Kaiser Permanente, 2012). For all scores between zero to four, patients were given anticipatory guidance by the APRN (see Appendix B). If a PHQ-9 score of five to nine was resulted, this indicated mild depression and patients received a self-referral to IBH services by the APRN, with anticipatory guidance. A telephone follow-up call was scheduled in two weeks to repeat the PHQ-9. For a score of 10 or greater, the KP depression management guidelines indicated moderate depression. These patients immediately received a triage assessment by an IBH provider on-site with a follow-up by IBH. If an IBH provider was unavailable, urgent care services were utilized for triage assessment to assure safety. For PHQ-9 scores of 15 to 19, this indicated moderately severe depressive symptoms and greater than 20 suggested severe depressive symptoms.

The next step that followed the PHQ-9 screening is the detailed medical chart review by the APRN. Specific data pertinent to the sample population was collected. This included medical record numbers, insurance type, age, gravity, parity, delivery type, nationality, and the antepartum PHQ-9 score. The data was transcribed onto an excel spreadsheet by the APRN or RN daily. This excel file was secured by password on a single desktop computer in the SDP office at the KP Mapunapuna Clinic. The final data point consisted of the PHQ-9 score from the postpartum visit at four to six weeks from delivery. Ongoing monitoring of the medical records to obtain this final score was conducted weekly. The three data points, the antepartum, the SDP visit, and the postpartum PHQ-9 score were compiled for each patient. All medical record

numbers were removed, with only de-identified data stored on the final excel spreadsheet file once all data collection points were completed.

Step 14: Evaluate outcomes

Process and outcome variables. The purpose of this practice change implemented an early depression-screening program in the SDP. There were two process outcomes evaluated in this project. The first process outcome was the SDP staff attendance to the in-service training on the PHQ-9 scoring and documentation in the EMR. The second process outcome focused on the SDP APRNs attendance to the in-service training on the PHQ-9 workflow process and the IBH referral process (see Table 2).

Table 2

Process outcomes

Who	What	When	How
SDP staff	100% attendance by SDP staff to training on PHQ-9 scoring and documentation in EMR	Prior to implementation	Attendance records
SDP staff	100% attendance by SDP APRNs to training on PHQ-9 workflow and IBH referral	Prior to implementation	Attendance records

Note. These were based on the short-term outcomes for this project.

The first outcome measure was to screen 75% of the postpartum women in attendance to the initial SDP visit with the PHQ-9 (see Table 3). The next outcome measure determined if a five percent increase in referrals by the APRN to the IBH for positive PHQ-9 screenings. The third outcome measure evaluated the total hours of overtime by the SDP staff related to the

project activities. The SDP manager reviewed the weekly SDP staff timesheets and calculated the hours of overtime per week related to the project activities. The final outcome measure was to increase the attendance of the KP PPD support group by five percent to be evaluated by the attendance records.

Table 3

Outcome measures

Who	What	When	How
SDP staff	Within seven weeks, the SDP staffs screened 75% or greater of postpartum women who attend the SDP visit with the PHQ-9.	Weekly	Medical chart review
SDP staff	Increase the current baseline percentage of women referred to IBH with positive PHQ-9 screening for PPD by 5%.	Weekly	Medical chart review
SDP staff	No increase in SDP overtime related to implementation of the QI project activities	Weekly	Budget audit
Participants	Increase the current baseline percentage of families attending the KP PPD support group by 5%.	Weekly	Attendance records

Note. These were based on the short-term outcomes for this project.

Required resources. The entire length of this project was approximately one year, with the implementation period of seven weeks. A logic model was created to illustrate the inputs, outputs, and outcomes goals that played a pivotal role during this practice change (see Appendix C). This table clarified the resources and activities that were necessary for implementation in this organization. No additional financial funding or budgetary requirements was required to

support the practice change. Manpower was a crucial role throughout the implementation process. There were several stakeholders that were essential to the successful implementation of this project. The SDP staff was essential to administering, scoring, and documenting the PHQ-9 scores. The timeframe for the SDP APRN to complete the PHQ-9 screening was initially unknown. As a result, the allotted visit length of 30 minutes per patient visit remained unchanged. The impact on productivity was debated and required workflow improvements throughout the entire implementation phase.

The IBH services had the greatest impact from this practice change. A rise in referrals increased patient utilization and provider demand. The wait time for an appointment with IBH was two to three weeks. With an increase in referrals, this further impacted appointment availability. Finally, the OBGYN staff was required to attend an in-service on the current workflow to ensure completion of the PHQ-9 during the antepartum and postpartum visits. This did not require additional resources or manpower, however staff training was necessary.

Measurements. Based on the organizational preferences, the validated depression screening tool implemented was the PHQ-9. This self-reported instrument was the selected depression-screening tool for pregnant and postpartum women. Flynn et al. (2011) suggested the PHQ-9 had a sensitivity of 71% to 84% and a specificity of 90% to 97%. The positive predictive value was approximately 59% in the primary care setting, increasing to 85%-90% in higher risk populations. This validated tool consisted of nine questions, each with a numerical scale that ranged from zero to three. The patient read each question and circled the appropriate numerical value to answer the question based on experiences in the past two weeks. The PHQ-9 score ranged from zero suggesting low to no risk, to the maximum score of twenty-seven, indicating

severe depression. Based on the KP Depression Management guidelines, all participants with a PHQ-9 score of five or greater were referred for PPD to the IBH for evaluation (Kaiser Permanente, 2012).

Timeline. A meeting with KP leadership and staff was completed in June of 2016 to update the team on the project (see Figure 4). In early July, the KP research department declared this project is not classified as research. This resolution allowed the project to move forward. A brief presentation to the OBGYN leadership team was held at the physicians meeting in July 2016. The DNP proposal defense was performed in late August of 2016 and approved by committee members. Training of SDP and OBGYN staff was conducted in August to ensure compliance with the practice change. Final workflow and PHQ-9 screening instruments was distributed in August 2016.

In mid September the implementation of the practice change began. The data collection period was over seven weeks, from September to November of 2016. The data was compiled, analyzed, and interpreted monthly. The ongoing data collection process will continue for two months post-implementation to ensure final data scores were collected. The completion of the final paper is expected in March of 2017. The final defense is scheduled for the end of March 2017, with the anticipated graduation date in May of 2017. Dissemination of the data will begin in June 2017 throughout the KP region, however the expectation is this practice change will be permanent to the SDP.

Tasks	2016								2017					
	M	J	J	A	S	O	N	D	J	F	M	A	M	J
Proposal defense														
IRB application process and approval														
Brief KP leaders and staff														
OBGYN leadership meeting														
Train SDP/OBGYN staff														
Prepare for instrument distribution														
Implement practice change														
Review process of practice change														
Collect data														
Compile data														
Analyze data														
Interpret data														
Final paper completion														
Final defense														
Graduation														
Dissemination to KP region														

Figure 3. Project timeline.

Program evaluation plan. This project focused on six short term outcomes (see Appendix C). The first two evaluation questions were to assess the SDP staff and APRN attendance to the in-service training sessions. The training attendance records were the source of the data collection. The next evaluation questions was based on the practice change. This first evaluated the total percentage of PHQ-9 scores documented into the patients medical record. The second evaluated the percentage of positive PHQ-9 scores of five and greater were referred to IBH. The next evaluation question estimated the financial impact on the SDP department budget. The SDP manager assisted with the budget audits and generated monthly reports of the SDP staff overtime exceeding the baseline. The final evaluation question determined if attendance to the KP PPD support group increased by five percent during the implementation phase.

Human subjects considerations. This quality improvement project was not a research study. The participants in this study were not randomly selected, as everyone attending a SDP

visit had equal participation. This study was not focused on any specific vulnerable populations. This evidence-based project adhered to specific evidence based guidelines as the framework. All participants included in this project did not suffer any adverse effects from this practice change. The current standard of care will continue to be implemented throughout the duration of this project. The aim was to provide benefit to mothers and families by encouraging an early depression screening.

Participant information including medical record number, race, gravity, parity, type of delivery, insurance type, age and PHQ-9 depression scores was collected during the intake process. All data was documented on a single excel spreadsheet throughout the project. This spreadsheet was secured on one desktop computer in the SDP office with password protection. The leader and co-leader of this project were the only two authorized staff members with access to this spreadsheet. At the conclusion of the implementation phase, all data was de-identified and medical record numbers were deleted. No back up file was saved containing any protected medical information.

The author for this project met the requirements by the University of Hawai'i (UH) and completed the Collaborative Institutional Training Initiative (CITI) course on Human Subjects Protection. This quality improvement project was reviewed, approved by a committee of faculty, and clinical experts to ensure adequate human subject protection. The ethical principle of autonomy ensured each participant understood the role and objectives with full disclosure of the project. Each participant received the maximum benefit from this project, referred to as beneficence (Adams & Callahan, 2013). The principle of justice ensured equitable selection of all participants involved in the sample. The principle of non-maleficence, to do no harm, was an

imperative safeguard in this project. The Health Insurance Portability and Accountability Act guidelines and requirements were enforced to assure protection of personal medical information as required by law.

Limitations. This quality improvement project had multiple limitations. The first limitation was related to the setting of the project. The variables and conditions related to the site of the practice change was not controlled. The second limitation was the sample population. There was no randomization or control group for this project. The broad inclusion criteria allowed nearly all participants to be included in the sample. There was a minimal exclusion criterion for this sample population in this study. This contributed to the distribution and representation constraints within the sample.

Based on the PHQ-9 screening tool, there were several limitations associated with the administration of this questionnaire. The PHQ-9 score was generated based on the participant responses, potentially leading to higher or lower scores leading to possible discrepancies. The level of reading comprehension and English fluency was not accounted for in this project. The data analysis section, did not include any risk adjustments, is another potential limitation. The quality of the data may be questionable as the timeframe is limited due to meeting the academic DNP course requirements. The last limitation was related to the actual implementation of the practice change. Several staff members distributed and scored the PHQ-9. Participants were allotted time for completion, however the time of administration of the PHQ-9 screening was not controlled.

Summary

This project implemented an early PPD screening program. The goal was to increase screening of postpartum women in the SDP using clearly defined processes and guidelines so a completed postpartum evaluation of depression was established. In chapter three, the purpose and objectives was outlined for this quality improvement project. The elements of the design, practice change proposal and definitions related to the project were discussed. The sampling plan of participants and the data collection procedures utilized were outlined. The program evaluation plan and human subjects considerations was addressed to meet all necessary ethical tenets. The final section outlined the anticipated limitations throughout the project.

CHAPTER 4. RESULTS

Step 15: Report the results of the preliminary evaluation to decision makers

Introduction. The implementation of the early postpartum depression (PPD) screening program in the Special Delivery Program (SDP) involved the integration of a standardized screening tool, the Patient Health Questionnaire-9 (PHQ-9). This is the current depression-screening tool utilized by the Kaiser Permanente (KP) Hawai‘i region. The screening tool was used to identify PPD symptoms in women one to three days after hospital discharge. If a PHQ-9 score of five and greater is detected, a referral was placed to the Integrated Behavioral Health (IBH) for earlier treatment services than the current standard of care. Prior to the implementation, staff members received a training session on the upcoming screening tools for this project. By following the John Hopkins Evidence Based Practice model, an initial one-week pilot study was implemented. Minor changes were made to the workflow based on the SDP staff feedback. After the finalized workflow for the project was established and approved by the SDP staff members, the implementation phase commenced (see Appendix B). The next steps included the data collection, monitoring, and analysis of the data provided from the sample in this project. Chapter four details the data from the project, including the sample description, trend analysis, and the evolution of the project.

Objective

Chapter four presents the sample description, data, and trend analysis for this DNP project. The John Hopkins Evidence-Based Practice Model served as a guide for this clinical practice change (Newhouse et al., 2004). Based on this model, step 15 includes the reporting of the results from the preliminary evaluation to core decision makers. This entails the

dissemination of the data collected from the project to the immediate stakeholders, which includes the SDP staff, the SDP manager, and the Obstetrics and Gynecology leadership team at KP. The objectives of the project, design, and proposed practice change were inclusive. The sampling plan and data collection processes are detailed in this section. A trend analysis of the data collection is included in this portion. The process and outcome measures were examined in this section with details of the evolution of this project.

Description of sample

Patient sample. The project commenced on September 19, 2016 and ended on November 7th, and extended over a seven-week timeframe at the KP Special Delivery Program (SDP) located at the Mapunapuna and Moanalua outpatient clinics. During the data collection period, the initial number of patients that visited the SDP was 143 patients. However, two patients were excluded due to immediate relocation out of state, resulting in a final sample of 141 postpartum women. Returning patients to the SDP received lactation and/or newborn care however the PHQ-9 screening was only performed at the initial SDP visit, one to three days after hospital discharge. The demographics for the sample are listed in Table 4.

The women in this sample were between 14 years to greater than 41 years old. The two most common types of insurance for this sample included private KP Health Maintenance Organization (HMO) health plan and government funded KP Medicaid. This sample consisted of 59 (42%) primiparous patients and 82 (58%) multiparous patients. Approximately 140 patients lived on the island of O‘ahu with a single patient that lived on Maui. There were 114 total vaginal deliveries and 27 cesarean section deliveries. Approximately half of the sample received OBGYN care from the Waipi‘o clinic, followed by the Honolulu Clinic, and the

Ko‘olau clinic. A total of 68 (48%) patients identified with the “Asian” ethnicity, 34 (24%) patients identified with “Polynesian” ethnicity, and 30 (24%) patients as “Caucasian” ethnicity. The gestational age at delivery was 35 weeks to greater than 41 weeks. There were a total of six deliveries between 35 to 36.6 gestational age, 43 patients delivered from 37 to 38.6 weeks gestation, 81 patients delivered from 39 to 40.6 week, and 11 patients delivering at greater than 41 weeks.

Table 4

Sample demographics

Measure	# of patients (n=141)
Age groups	
14-25	34
26-35	87
36-40	16
>41	4
Insurance type	
KP HMO	88
KP Medicaid	31
Other	22
OBGYN Clinic	
Waipi‘o	73
Honolulu	47
Ko‘olau	21

Table 4 (continued)

Sample demographics

Island residence

O‘ahu 140

Maui 1

Ethnicity

Asian 68

Caucasian 30

Polynesian 34

Other 9

Gravity

Primiparous 59

Multiparous 82

Delivery type

Vaginal 114

Cesarean section 27

Gestational age

35-36.6 6

37-38.6 43

39-40.6 81

> 41 11

Trend analysis for process and outcome variables

Process outcome measures. Prior to the start of the project, two separate training sessions were available for the SDP staff. The first training session was designed for the SDP support staff, which included the registered nurse, the SDP manager, and the certified medical assistant (see Table 5). This session detailed the PHQ-9 screening tool, reviewed scoring, and the documentation in the electronic medical record (EMR). Role-playing assisted the staff to practice the workflow, answer patient questions, and document the results into the EMR. The total number of SDP support staff for training session one was three, with all support staff in attendance for the entire duration. The percentage of SDP support staff that attended the first training session was 100%.

The second training session was designed for the three APRNs of the SDP (see Table 5). This session discussed the PHQ-9 screening tool, the integrated behavioral health (IBH) referral process in conjunction with the KP depression guidelines, and patient education. The role-playing assisted the APRNs to formulate a treatment plan and provide patient education. The total number of APRNs in the SDP was three with all in attendance for the entire training session. The percentage in attendance for the second training session was 100%. Both training sessions had 100% attendance, confirming the support staff and the APRNs of the SDP department completed the training sessions prior to the implementation of this project.

Table 5

Process evaluation of SDP staff (n=3) and APRN (n=3) attendance of training

Measure	Sample	# Attended	% Attended
Support staff	n=3	3	100%
APRN staff	n=3	3	100%

The initial sample for this project was 143, two patients relocated during the project; therefore the final sample was 141 total patients (Table 6). All 141 patients were screened with the PHQ-9 at the initial SDP visit with a screening percentage of 100% (Figure 4).

Table 6

Final SDP sample and PHQ-9 screening %

Measure	Patients	Excluded	Sample	% Screen
Sample	143	2	n=141	100%

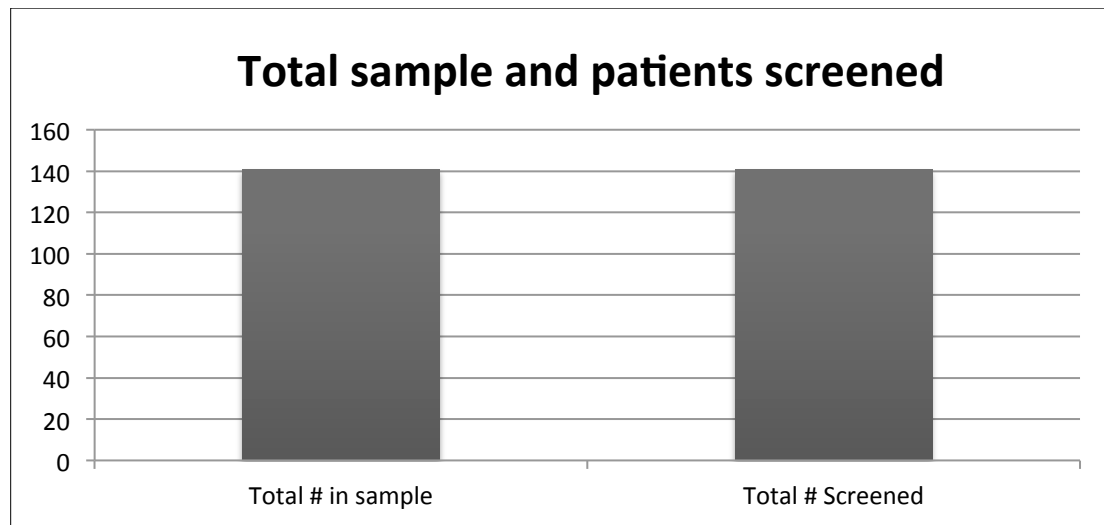


Figure 4. Total SDP sample and patients screened. The PHQ-9 was utilized for screening.

This project provided quality monitoring of PHQ-9 scores at three data points- antepartum, SDP clinic visit (during the first week postpartum), and four to six weeks postpartum visit during the routine OBGYN follow-up visit (see Figure 6). In this sample of 141 patients, 44 patients were screened with the PHQ-9, resulting in 97 patients not screened during pregnancy (see Table 7). The screening percentage during this antepartum period was 31.2 %. Based on the 44 patients screened, 30 patients scored zero to four that indicated no depressive symptoms. However, 14 patients (31.8%) of patients scored five to nine on the PHQ-9 indicating mild depressive symptoms. Of these 14 patients, eight patients were multiparous and six were primiparous status. The medical chart audits revealed antepartum screening with the PHQ-9 was completed between five to thirty-six weeks gestation. This project noted inconsistencies with administration, timeframe, and documentation of the PHQ-9 in the antepartum period.

The PHQ-9 screening at the SDP visit reported 13 patients scored five to nine, indicating mild depressive symptoms (see Table 7). Of these 13 patients, eight were multiparous and five were primiparous, leading to questions about whether previous childbirth status is a considerable factor for the development of depressive symptoms during this initial phase, or, it is possibly related to the challenges a woman faces when having additional responsibility of a newborn when a mother is already caring for other children. The positive screening percentage of mild depressive symptoms during this early postpartum period was 10.8% based on our sample. All 13 patients with a positive PHQ-9 at this SDP visit were scheduled for a follow up telephone call to repeat the PHQ-9 after two weeks. The two-week follow-up scores are illustrated in Figure 5.

Table 7

PHQ-9 scores for antepartum, first SDP visit, repeated SDP telephone screening, and routine postpartum visit

Measure	# of patients
Antepartum (n=141)	
0 to 4	30
5 to 9	14
Not screened	97
SDP visit (n=141)	
0 to 4	128
5 to 9	13
Repeated PHQ-9 scores (n=13)	
0 to 4	11
Unable to contact	2
Postpartum visit (n=141)	
0 to 4	104
5 to 9	13
10 to 19	3
Not screened	11
No show	10

Of the 13 patients with a positive PHQ-9 at the initial SDP visit that were scheduled for a two-week telephone follow-up call to repeat the PHQ-9 screening, two patients were unable to be contacted and 11 patients completed the repeat PHQ-9 via telephone (see Figure 5). All 11 of the patients completing the PHQ-9 scored zero to four on the repeated PHQ-9 screen, indicating no depression symptoms were detected. This decline in PHQ-9 scores two weeks later is reassuring that the depressive symptoms might have subsided after recovering from childbirth.

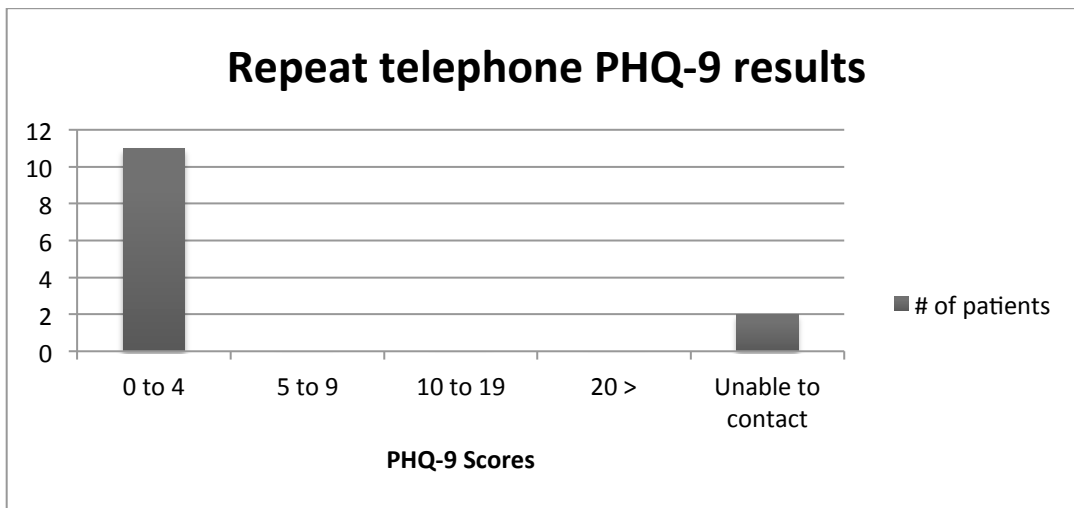


Figure 5. Repeat telephone PHQ-9 results. Patients with initial PHQ-9 score of 5> repeated the PHQ-9 (n=13) via telephone by the APRN two weeks after the initial screening.

During this routine postpartum visit, 21 patients were not screened with a PHQ-9, failed to show for the scheduled postpartum visit, or declined the PHQ-9 screening tool (see Table 7). Of the 120 patients successfully screened at the postpartum visit, 103 patients scored zero to four on the PHQ-9 screening tool indicating no depressive symptoms (see Figure 6).

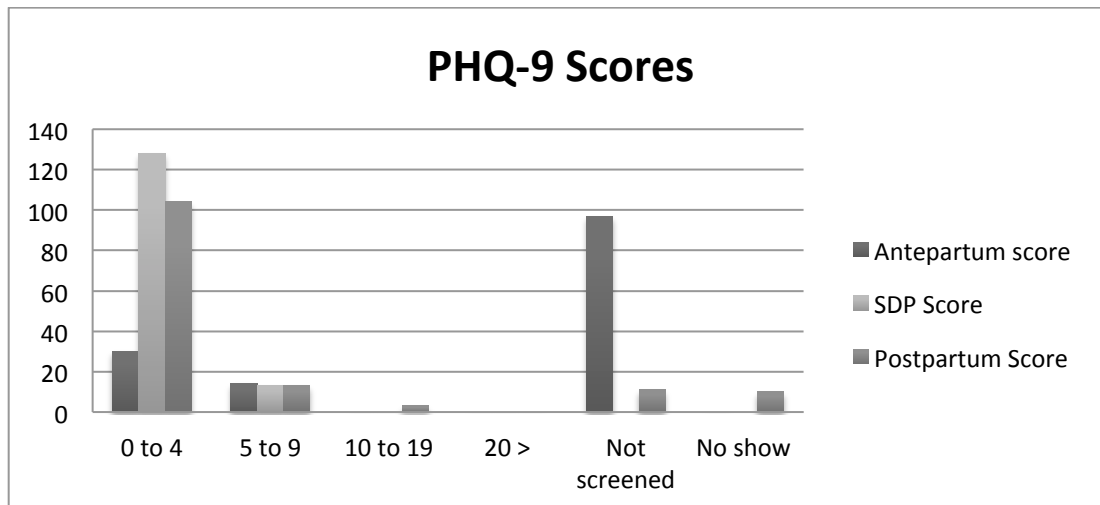


Figure 6. PHQ-9 score results. Data collected from three points included the antepartum visit, the SDP visit, and postpartum visit.

However, 15 patients or 12.5 % of the 120 patients scored five to nine, indicating mild depressive symptoms. Of these 15 patients, 11 were multiparous and four were of primiparous status. Two patients or 1.6% of the patients scored 10 to 19 on the PHQ-9 screening tool indicating moderate depressive symptoms. Both patients in this moderate depression category were primiparous. The percentage of postpartum depression in sample was 14.1 %, which is noted to be within the U.S. median range of 14-15% of women experiencing depression in the first 3 months after childbirth (Hanusa et al., 2008).

Outcome measures. The SDP early postpartum depression-screening project was initiated on September 19, 2016 with completion on November 7, 2016, for a total of seven weeks. The first week of the project was the piloting phase. After the first week was completed, the SDP staff identified barriers and adjusted the workflow to increase efficiency. The final sample of patients participating in this project was 141 KP members (see Table 6). The SDP screening percentage was 100% with all 141 patients with documented PHQ-9 scores in the

EMR (see Figure 4). The targeted outcome measure for this project was a screening rate of at least 75%; therefore, the minimum target percentage was achieved and exceeded. This screening percentage demonstrated the SDP effectively screened and documented the results of the PHQ-9 based on the proposed workflow. This data validates administration of the PHQ-9 is sustainable in the SDP as a standard practice for future depression screening.

The second outcome measure was to increase the current baseline percentage of women referred to IBH with a positive PHQ-9 screening for PPD by 5%. This project introduced a new workflow to the SDP therefore baseline data was unknown. The final sample was 141 patients with 13 or 10.8% of patients with reported positive PHQ-9 scores between five to eight, indicative of mild depression. Of the 13 patients, ten patients were referred by the APRN to IBH with three failing to be referred (see Table 8).

Table 8

Patients referred to IBH by SDP APRN after a positive PHQ-9 result of 5 or greater

Measure (n=13)	Yes	No	% Referred
# Referred to IBH	10	3	76.9 %

The percentage of patients referred to IBH by the APRN was 76.9% (see Figure 7). This referral percentage achieved and exceeded the targeted rate of 5% further validated the current referral process was effective. In the future, increasing the IBH targeted referral percentage to 95% would further encourage motivate the APRN staff to adhere to a standardized workflow.

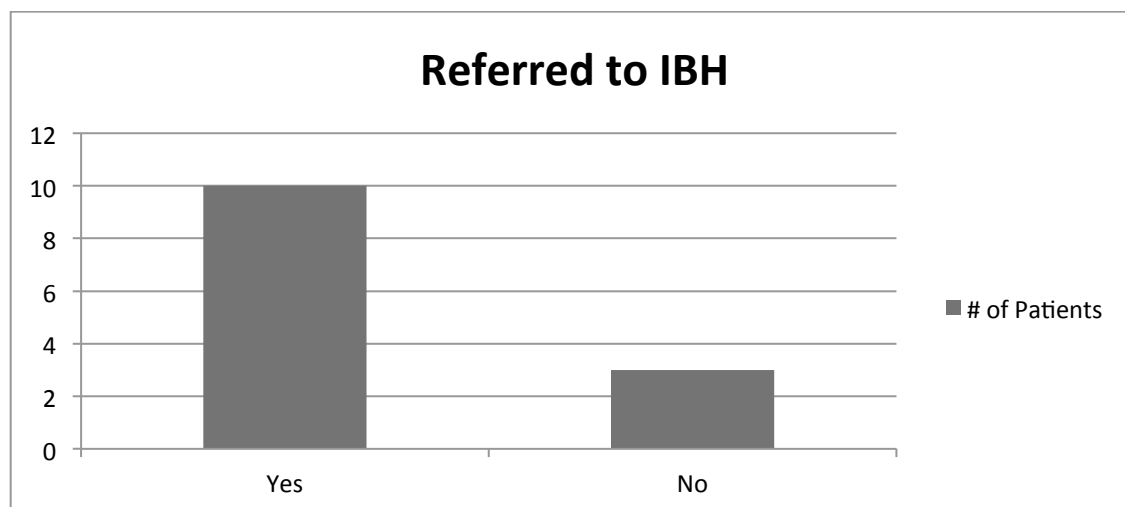


Figure 7. Referred to IBH by SDP APRN. SDP patients (n=13) with PHQ-9 score of >5 and referred to IBH by APRN.

The third outcome measure targeted no increase in SDP overtime related to the implementation of this project. The SDP overtime budget was reviewed and calculated by Mary Kawasaki, the SDP manager. All six SDP staff members generated between one to three hours of overtime per month as a baseline in August (see Table 9). In September, 4.5 hours of overtime were accrued. In October, the number of overtime hours decreased to 3.75 hours for the month. Then in November, the overtime hours continued to decline to 3.0 hours. The initial rise in overtime might be attributed to the additional responsibilities for the SDP staff. The additional patient education topics and referral process might have resulted in delays for the APRNs. The overtime hours initially exceeded the baseline in September and October; however, during the month of November, overtime hours were at baseline. Further studies to evaluate the contributing factors causing the overtime would be necessary in the future. Overall, this project fulfilled the outcome measure to report no increase in overtime related to the new practice change. The initial report demonstrated a minimal but expected increase in overtime by the SDP

staff. As the SDP staff adjusted to this practice change, the overtime hours returned to baseline status, making the project cost neutral.

Table 9

SDP staff overtime hours per month

Measure	Baseline	September	October	November
Monthly overtime	1-3 hours	4.5 hours	3.75 hours	3.0 hours

The final outcome measure was to demonstrate an increase in the current baseline percentage of families attending the KP PPD support group by 5%. At the start of the implementation period, the IBH providers declined to initiate a support group based on lack of data regarding the prevalence of postpartum depression with the KP organization. The KP leadership and executive team supported this decision to delay the formation of a support group. Once the prevalence and the sample description were available from this project, the KP organization and IBH providers are expected to evaluate the need for support groups for women who have a positive screening results for depressive symptoms. As a result, a KP support group was not established nor was attendance to a group session collected for this project to meet the outcome measure.

Evolution of project

Prior to the pilot project initiation, weekly meetings between the co-leader, Mary Kawasaki and the DNP student were completed. The topics discussed included the SDP budget, the proposed workflow, and the training sessions for the staff. During the monthly SDP staff meetings in August and September, the SDP staff expressed feedback and potential barriers

regarding this project. As the implementation date approached, the feedback from the SDP staff assisted in the completion of a tentative workflow process. After the one-week pilot study was completed, the project was fully implemented the following week with a finalized workflow proposed by the SDP staff. Weekly meetings were helpful for the SDP staff to review the workflow and the barriers. The SDP staff was required to attend these meetings, which proved to be an essential platform for the staff to collaborate on the project. At the midway point, the support staff expressed familiarity with the process and fully adjusted to the new workflow. The APRNs expressed concerns about the insufficient appointment length and the additional educational topics. However, by the end of the project, the SDP staff adjusted to the new workflow and believed it provided additional quality to the patient and family.

Staff education. The SDP department consisted of six staff members, three advance practice registered nurses (APRNs), one registered nurse, one certified medical assistant, and the SDP manager. The staff trainings were divided into two sessions, training one for the SDP support staff and training two for the APRNs. All SDP staff members attended the 60-minute training session held at the Kaiser Mapunapuna Clinic. Staff members signed in at arrival and were required to be present for the entire training session.

While adhering to the John Hoskins Evidence Based Practice model, the SDP staff was educated on the steps of this model. A brief overview was given regarding the necessary tasks that were associated with each step during the implementation phase. Training session two for the nurse practitioners include an overview of postpartum depression, the guidelines for depression management, and the follow up procedures. An overview of the PHQ-9 screening tool with a review of the questions, answers, and scoring were included. A step-by-step

demonstration regarding the necessary documentation, patient instructions, and follow up visits in the electronic medical record were incorporated. Training session one for the support staff focused on the administration of the screening tool. The steps included communicating with the patient about this new process, escorting only the mother and infant to the exam room, and giving the patient time to complete the screening tool. The SDP support staff was given scenarios to role-play during the training sessions to gain confidence and familiarity with communicating to the patient and family. To pass the training session, all SDP staff members were required to review, score, and document a completed PHQ-9 into the EMR successfully.

Expected versus actual outcomes

The focus of this project provided early postpartum depression screening in the SDP. The SDP support staff verbalized many concerns about the additional tasks and potential resistance from patients throughout the pilot study. After two weeks of the project's implementation, the support staff reported that additional tasks did not cause significant delays since patients were familiar with the PHQ-9 screening tool. The SDP support staff administered and documented the screening tool in less than five minutes, significantly faster than initially performed during the training sessions. The SDP staff found no patients declined or refused to complete the screening tool. There were no reported complaints from families during the project regarding the process. The SDP staff suggested the PHQ-9 to be translated into various languages common in Hawai'i since English and Spanish were the only available versions.

During the initial training sessions, the APRNs were very resistant about the implementation of the project specifically due to the potential time constraints. The APRNs were concerned about the length of time for the additional educational topics and the follow-up

steps for positive PHQ-9 screenings. Throughout the project, the APRNs were satisfied with the new workflow and found administration of the screening tool to be very straightforward. The APRNs reported the project provided a platform to discuss postpartum depression while adding value to patients and spouses.

During the planning stages of this project, the anticipated sample size was between 300 to 350 postpartum women. These figures were based on 2015 patient census data collected by the SDP. The initial timeframe for implementation of this project was three to four months, however, this was reduced to seven weeks due to data reporting constraints. The total SDP patient census was significantly lower than expected. This resulted in a final sample of 141 patients for the project.

For PHQ-9 scores of 5 and greater, a self-referral to the IBH was the proposed workflow for this project. This was related to the limitations in the IBH staffing and the current workflow processes in the KP Hawai'i region. Prior to the project, the IBH and SDP departments collaborated to ensure a smooth roll out of the project. However, after the pilot study was completed, the IBH department declined to actively participate in this project, thus prevented the creation of a postpartum depression support group. The IBH manger and providers rejected the need to create a support group, since there was no objective data on the rates of postpartum depression within KP organization. The SDP manager agreed to delay the formation of a PPD support group and ensured this as a goal for the future.

Step 16: Secure support from decision makers to implement recommended change internally

Facilitators. A key facilitator in this project was the SDP support staff, APRNs, and the SDP manager. During the initial training session, the SDP staff expressed several concerns about the purpose, proposed workflow, and time constraints. During the pilot study, several changes were made and the SDP staff developed a finalized workflow. The weekly SDP staff meetings and the teamwork demonstrated to be an essential component in facilitation. As the project progressed, the SDP staff demonstrated expertise on the administration and documentation of the PHQ-9. The APRNs found the anticipatory guidance for patients to be straightforward and well accepted by patients. The SDP manager assisted with marketing the project throughout the organization and received positive feedback from upper management associates.

In the KP organization, physician champions provide support and credibility to a project. As a mentor, Dr. Sueda (a KP obstetrician) was essential in marketing the project among the OBGYN physicians throughout the outpatient clinics. After the regional presentation to the OBGYN department, many of the OBGYN physicians expressed acceptance, encouraging the additional PHQ-9 screening. The physicians on the neighbor islands expressed interest and requested the project to be further expanded. As a key facilitator, Dr. Sueda provided frequent updates to the OBGYN department. This reinforcement strengthened the project and promoted the importance throughout the OBGYN department.

Barriers. The most significant barrier to this project was the lack of participation and communication from the IBH department. Initially, the IBH providers were excited and supportive about the project. The meetings prior to implementation and during the pilot study were successful; however once the finalized workflow was created, the participation from the

IBH department declined. This lack of participation and interest could possibly be related to the staffing shortages and increased demands of the providers. This barrier prevented the creation of the postpartum depression support group within the KP organization.

The next most significant barrier of this project was time. At the beginning of the project, the administration and documentation of the PHQ-9 was a very lengthy process. As the project progressed, the SDP staff was more efficient and decreased the administration time to three to five minutes. When a positive PHQ-9 was detected, patient education was provided by the APRNs, thus added to the length of the visit. The anticipatory guidance handouts given to all patients was lengthy, requiring additional time for patient teaching at the end of each visit.

Summary

This project implemented an early depression screening in the SDP. This provided earlier detection of postpartum depression symptoms utilizing a standardized depression-screening tool, the PHQ-9. The results of this project were collected over a seven-week timeframe with the assistance from the SDP staff. Chapter four reviewed the results, process, and outcome measures of the project. The expected versus the actual outcomes were discussed. The project evolution, facilitators, and barriers of the project were identified to acknowledge the challenges. While the barriers were unexpected, these challenges were key to assisting with improvement for the future.

CHAPTER 5. DISCUSSION

Interpretation of findings

The early postpartum depression-screening program was implemented at the Kaiser Permanente (KP) Special Delivery Program's (SDP) Mapunapuna and Moanalua clinics. The postpartum women visited the SDP one to three days after their discharge from the hospital. The SDP standard of practice previously did not include depression screening. The utilization of the Patient Health Questionnaire-9 (PHQ-9) in the SDP was a new process for the department. The SDP staff administered the PHQ-9 screening tool to the patient and documented the results into the patient's medical record. Based on the score, the advance practice registered nurse (APRN) determined an appropriate follow up and treatment plan based on the KP depression management guidelines. Education on postpartum depression would be provided to all patients and families.

Screening results. The current standard of care in all KP OBGYN clinics is to screen for depressive symptoms with the PHQ-9 screening tool at least once during pregnancy. Based on the findings, there are several conclusions that can be learned from this project.

The first is the screening during the antepartum period will need improvement to increase the screening percentages. The screening percentage was 35.2% in the antepartum period compared to 85.1% at the routine postpartum visit. This significant discrepancy warrants closer evaluation for the lack of a more consistent approach to PHQ-9 depression screening during pregnancy. As a result, OBGYN staff may benefit from an additional training sessions to review depression, the PHQ-9 screening tool, and proper documentation of results of the screening, as well as referral of those women who are in need of further evaluation and/or treatment. A

standardized protocol for depression screening during pregnancy, immediately after delivery, and at the routine postpartum visit would be beneficial.

The second aspect is that the results from this early depression-screening program needed further evaluation longitudinally to establish validation of the use of this screening questionnaire in the population of patients KP serves. The PHQ-9 scores at each time point, antepartum, the SDP visit (i.e., early postpartum visit), and routine four to six week postpartum visit detected mild depressive symptoms more frequently in multiparous mothers. This potential risk factor may need further evaluation due to the diverse population in Hawai'i. Grier & Geraghty (2015) stated PPD commonly occurs within the first three months postpartum, with the peak onset at four to six weeks. This project validated this finding based on higher scores detected at the routine postpartum visit than during pregnancy and at the SDP visit. Although the patients that had scores in the mild depressive symptoms range were referred to IBH, whether treatment was initiated is unknown. Closer evaluation of the individual PHQ-9 scores from the antepartum score, the SDP score, and the routine postpartum visit will need to be assessed in the future.

The final aspect identified was the absence of IBH services in the KP organization. The shortage of IBH providers and delay in appointments negatively impact patient care. The IBH department will need further evaluation to create resolutions to improve access and timely treatment for those mothers with documented depressive symptoms when screened during pregnancy and postpartum.

Step 17: Identify next steps

The implementation of the early postpartum depression-screening program was very well received among the SDP staff and patients. The SDP staff formulated a manageable workflow

that assisted with the screening and referral process to the IBH department. The patients were very open about completing the additional PHQ-9 screening questionnaire during the SDP visit without having criticism. The OBGYN physicians were appreciative of the efforts to assist with earlier depression screening and referral. Overall, this new workflow for depression screening was efficient and cost effective for the SDP department.

Following the dissemination of the results to the KP Hawai‘i region, the SDP department should update the scope of practice to include the PHQ-9 screening. This ensures the SDP staff would be in compliance with a standardized workflow protocol to assess for this important health issue. An update of the KP OBGYN department practice guidelines next year to include the early postpartum depression screening during the first week after birth will further promote standardization throughout the region. This ensures all KP services areas will adhere to the same recommendations, promoting the use of a standardized screening tool and assuring quality of care. Education and promotion of depression screening throughout the region must continue based on the low percentage of antepartum screening rates. The OBGYN staff may benefit from attending a training session similar to the session attended by the SDP support staff. This will further promote screening, assist with EMR documentation, and increase the knowledge base on postpartum depression.

In the future, increasing the IBH staff with a provider dedicated to women experiencing postpartum depressive symptoms is essential. This IBH provider will assist in the formulation of a postpartum depression support group for all KP members on each island. This will require the collaboration of several departments including the SDP, the OBGYN physicians, and the IBH providers. The upper level managers and executives will be key to facilitating this process.

Once all three departments form a partnership, the formulation of a support group would be inevitable. This resource would be beneficial for all KP members and families experiencing postpartum depressive symptoms.

Implications and recommendations

Essential I: Scientific underpinnings for practice. In the United States “About 14-15% of women experience depression in the first 3 months after childbirth” (Hanusa et al., 2008, p. 586). The results from this project demonstrated the need to create a standardized workflow to support and routinely screen early postpartum depression screening in the KP organization. Utilizing a validated screening tool is beneficial to maintain continuity. Finally, the implementation of this new practice change with the PHQ-9 was demonstrated to be cost neutral and, therefore, sustainable.

Essential II: Organizational and systems leadership for quality improvement and economics. The early identification of depressive symptoms aimed to initiate earlier treatment services, reducing the negative impacts of depressive symptoms and conditions on the patient and family unit. This project demonstrated the implementation of this new practice change based on staff overtime proved to be cost neutral in the KP organization. This project identified several patients with mild depression, avoiding the need for further healthcare with the potential to improve cost savings. This early screening project could be beneficial to all KP regions nationwide.

Essential III: Evidence-based practice and translation science. This project integrated the components of Evidence-Based Practice, the categories of problem, evidence, and translation. Utilizing these three components, the Johns Hopkins Nursing Evidence-Based

Practice Model is organized with a step-by-step approach, that includes a total of 18 steps for precise implementation. This model created the framework for the project to assist with data collection, interpretation, and dissemination. The barriers to practice change included time, staff support, and awareness of problem. The literature synthesis revealed a lack of higher quality studies that identified mood alterations. In the future, additional research to improve higher quality studies regarding this postpartum population would be advantageous.

Essential IV: Information systems and technology. This project implemented an early depression-screening program, utilizing the PHQ-9 screening tool. The PHQ-9 score was documented into the patient's EMR. A self-referral to IBH for patients with PHQ-9 scores of five and greater was recommended. This project relied on the EMR system to access patient medical records, follow up on the referrals to IBH, and evaluate longitudinal PHQ-9 scores. The EMR system proved to be a necessity in this project and for future research to ensure quality results and tracking.

Essential V: Health care policy and ethics. This project created an early depression-screening program in the SDP to eliminate a gap in the KP health care delivery system. The next step would be to update the current KP OBGYN practice guidelines at the next annual review session in 2018. This policy update would re-emphasize the importance of routine antepartum depression screening, and recommend the initiation of an early postpartum (i.e., during the first week postpartum) depression-screening program with the PHQ-9 screening tool. This project provided equal care to all patients with specific attention to privacy during screenings and follow up telephone calls. Confidentiality and privacy were maintained during the project as each

patient was screened alone. This was essential due to the stigma associated with psychological conditions (e.g., depression) and strict adherence to privacy tenets.

Essential VI: Inter-professional collaboration. This quality improvement project required a multi-disciplinary team approach to ensure a smooth transition. This team included the staff from the SDP, OBGYN providers, the IBH providers, and the KP management team. Each specialty provided expert knowledge and leadership to assist with the transition of the project. The DNP student and the SDP manager provided the overall leadership and oversight of the project. To ensure high quality care, a mental health expert or IBH provider is essential to sustainability. This project failed to initiate a KP postpartum support group reiterating the importance of a dedicated IBH provider.

Essential VII: Prevention and population health. This quality improvement project was designed to provide an early depression screening process to assist with the identification of postpartum depressive symptoms. The purpose was to promote earlier screening, referral for treatment, and education regarding postpartum depression. The project promoted early screening to minimize irreversible harm to the patient and the family unit. This early screening promoted total health and wellness for the patient and newborn. Besides the KP organization, this project could be integrated into the community health system. To promote continuity of care following the SDP visit, the incorporation of a public health nurse (PHN) would be beneficial in this population. The PHN can assist the woman transition back into her home and community, as well as provide additional resources to help support her. The PHN would provide case management to the patient and family during the postpartum period and facilitate the patient's attendance at routine postpartum and, if needed, behavioral health visits. A future

recommendation would be to create or add to lists of community resources for women suffering with postpartum depression to improve outreach.

Essential VIII: Advanced nursing practice and education. This project promotes the improvement of patient care outcomes from earlier identification of depressive symptoms. Utilizing the APRNs in the SDP, the purpose is to identify, refer, and educate the patients regarding postpartum depression. This project has enhanced the holistic care provided by the APRNs to the mother and newborn. The PHQ-9 promotes the implementation of a validated depression-screening tool utilized throughout the KP Hawai'i region. In the future, a study to test with effectiveness of PHQ-9 screening with different levels of staff such as a licensed practical nurse, registered nurse, and the APRN would enhance the evidence that is available in the literature about this process. To maximize the APRNs skillset, a PHQ-9 could be administered online or via a smartphone with patients scoring in the mild depression range to be followed up by the APRNs. This would minimize the patient workload of the APRNs and target those patients warranting a follow up.

Step 18: Communicate findings

Plans for dissemination. The submission of the final paper is expected to take place in March of 2017. The public defense proposal will take place within four weeks thereafter. The process and outcomes of this project will be submitted for consideration for conference presentations and publications to enhance the current literature on postpartum depression screening and the utilization of the PHQ-9 depression-screening tool during the first week after childbirth. The 18 steps of the John Hopkins Evidence Based Practice Model assisted to provide

the framework of this project. This project will enhance the current literature surrounding the implications of the John Hopkins Evidence Based Practice Model.

The final results of this project will be reviewed with two separate groups, the SDP staff and the OBGYN providers. This is specifically related to location and time constraints of both parties. The final results for the SDP staff will be presented in a two to three page handout that will describe the sample, the results, and the trend analysis. The OBGYN providers will receive a condensed version of the results in a power point format since the presentation will be conducted in a virtual meeting. Ongoing discussion has been initiated with leadership to revise the current OBGYN practice guideline next year and the SDP scope of practice. Once the updates are finalized, the early postpartum depression-screening program in the SDP will be the standard workflow. The future of this early depression-screening program in the SDP would include creation of a support group, longitudinal evaluation of PHQ-9 scores, and monitoring the rate of treatment by the IBH department.

Summary

The early postpartum depression-screening project in the SDP demonstrated early screening with a validated tool is sustainable and cost neutral. The integration of this new practice change with the PHQ-9 screening tool was efficient and effective in this early postpartum period. The KP depression management guidelines assisted providers to deliver consistent follow up care. The creation of a multi-disciplinary team with the SDP staff, the IBH providers, and the OBGYN providers was beneficial. The collaborative effort with the KP executive leadership team and the SDP manager assisted in the marketing of the project to generate support throughout the department. Despite the limited IBH resources in the KP

organization, future efforts to recruit a provider specializing in postpartum depression are ideal. This provider would establish and maintain a KP postpartum support group, a resource currently unavailable in the region.

The SDP workflow process created for the KP organization to implement this early postpartum screening was easily adapted by staff and by patients. The training sessions prior to implementation with the SDP staff members demonstrated to be highly effective to increasing knowledge base. This workflow process for routine early postpartum depressive screening could be easily replicated throughout other organizations and in community health centers. The KP EMR was an essential tool in this project to providing continuity of care and adequate follow up was completed. The EMR assisted in the tracking of the PHQ-9 scores across two to three different screening points. This project utilized the EMR to the fullest capacity to input, monitor, and communicate PHQ-9 scores among providers. Future studies focusing on early postpartum depression screening over the course of six months to one year could enhance the current research.

This project assisted to identify depressive symptoms earlier to ensure the activation of treatment services. The education and anticipatory guidance provided by the APRN was a valuable asset to patients and families. This project gained approval by the SDP staff, OBGYN department, and executive leadership to be incorporated into the SDP scope of practice and standard workflow. The aim for next year is to include this early postpartum depression screening into the OBGYN practice guidelines for the KP Hawai'i region. The standardization of depression screening throughout the KP organization assures members will receive the highest

quality care. The promise is to keep the health and well being of the newborn and mother as the highest priority.

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Appendix A

Literature matrix

Author	Year	Journal	Manuscript Title	Research Question	Study Design	Location-City/Country	Sample	Limitations	Data Collection	Findings	Comments	Level
Adewuya, A. O.	2005	Am J Obstet Gynecology	The maternity blues in Western Nigerian women: prevalence and risk factors	Study the prevalence of MB and risk factors associated in a group of Nigerian Postpartum women	Descriptive Study	Ilesa Township, Nigeria	n=502 women with normal vaginal deliveries from 5 health centers	Many Africans do not attend any antenatal clinic. High rate of exclusion and drop out. Women w/ C-sections were not included.	Initial questionnaire on sociodemographic info completed. Maternity Blues scale were administered for women to complete from day 1 to day 10.	Prevalence of MB was 31.3%. Single mother's at higher risk. 87 women (55.45%) experienced blues 1-2 days, 34 (21.7%) has blue for 3-4 days, 19 (12.1%) has blues for 5-6 days, while 17 (10.8%) has blues >6 days. Symptoms peaked on 5th day, depressed mood, crying, anxiety, & restlessness.	MB found in US 41.8 %, < 76% in Britain, 31 % in Poland, and higher in Japan. Small peak in sx noted at day 2, possibly r/t dysphonic response to childbirth.	
American College of Obstetricians and Gynecologists	2015	Obstet Gynecol	Screening for perinatal depression. Committee Opinion No. 630.	Recommendations for perinatal depression screening	Committee Opinion	USA	N/A	N/A	N/A	American College of Obstetricians and Gynecologists(ACOG) recommends clinicians screen pts at least 1 time during the perinatal period. Depression screening alone is insufficient, must combine treatment and appropriate follow-up when indicated.	ACOG is the leader in women's health topics, with this new standard, practitioners must change workflow processes to comply with this new guideline. Several screening tools mentioned, not 1 in particular over others. ACOG also recommends a collaborative care model to ensure adequate treatment	
Anding, J., Rohrer, B., Grieshop, M., Schucking, B., Christiansen, H.	2015	Front Pediatr	Early Detection of Postpartum Depressive Symptoms in Mothers & Fathers. The Relation to Midwives' Evaluation and Service Provision.	Evaluate the presence of PPD in mothers & fathers. The detection of distressed parents by midwives in a primary care setting.	Quasi experimental design. A Community-Based Study	Germany	Final sample: Mothers n=216, Fathers n=185, Midwives=198	Sample size of the control group was small with high drop-out rates. Second set point for data collection @ 6 mos was outside window of midwives care. Limited generalizability d/t midwives recruiting families, creating potential sampling bias	Midwives were assigned to either Control Group (CG) or the Intervention Group (IG). During the study period, mothers, fathers, and midwives completed questionnaires at 2 wks. after delivery (t1) and 6 mos later (t2). Control Group (CG) midwives with standard care of families till 8 wks and Intervention Group (IG) w/ prolonged postpartum care till 6 mos.	Significant number of parents with high levels of psychological distress after birth and at 6 mos postpartum. For mothers, 9% had elevated depressive sx at t1 and t2 and fathers had sx 6% at t1 and t2. Midwives identified 48% at t1 and 50% at t2 of women with high EPDS scores, leaving 50% undetected.	Midwives care is focused on mother & baby, rather than father. Half of women went undetected, thus requiring need for validated screening tool, versus assessment.	
Balbierz, Amy, Bodnar-Deren, Susan, Wang, Jason, Howell, Elizabeth	2015	Maternal & Child Health Journal	Maternal Depressive Symptoms and Parenting Practices 3-Months Postpartum	Association between PPD sx and parenting practices in a diverse sample population.	Review of 2 Randomized controlled studies reviewed	New York City	n=1,080 postpartum women, 18 yrs. or >, who delivered in a hospital located in East Harlem in New York City, 135 non respondents. Final sample=945.	Data collection only from 1 hospital, can't be generalized. Self report tool was used on parents.	945 women completed in-patient hospital survey and 3-mo survey,	Maternal depressive sx associated with non-adherence to safety practices. Depressive sx not related to feeding & healthcare practices.	1/3 of the sample born outside of US. Need for early intervention d/t increase safety concerns for infant.	
Banti, S., Mauri, M., Oppo, A., Borri, C., Rambelli, C., Ramacciotti, D., Montagnani, M., S., Camilleri, V., Cortopassi, S., Rucci, P., Cassano, G. B.	2011	Compr Psychiatry	From the third month of pregnancy to 1 year postpartum. Prevalence, incidence, recurrence, and new onset of depression. Results from the perinatal depression-research & screening unit study	To evaluate the prevalence, incidence, recurrence, and new onset of Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, minor and major depression .	Logitudinal Study	Northern Italy	n=1066 pregnant women were recruited from 3rd month of pregnancy and followed until the 12th month postpartum. Mean age was 32.3 years.	Low response rate in this study. EPDS cutoff scores were 13 antenatally and postnatally, lower than the 14/15 suggested score, and higher than the 9/10 recommended for the postpartum period for PPD. Serial interviews may have decreased prevalence rate of PPD as seen as a therapeutic or preventative intervention. Study population with homogeneous socioeconomic status, predominantly married, employed women, with average socioeconomic status.	Interviews with each mother using the EPDS tool, if scores were exceeding 12. Mood section of the SCID were administered. For women scoring 10-12, SCID was administered via telephone to reduce false negatives. Assessments done at 3rd, 6th, 8th month during pregnancy. 1st, 3rd, 9th, and 12th most postpartum	Overall 142 women diagnosed with minor and major depression. 92 women met this diagnosis at entry, 32 with their first episode, and 55 had recurrent depression. Minor to Major depression decreased from 8.6% @ the 3rd month to 1.7% @ the 8th month. In the postpartum period, 3.2% at 1 mo and 1.2% at 9 mos postpartum. Minor to Major depression was found high in pregnancy at 12.4% vs 9.6% in the postpartum period.	This study assumes that a multi-professional network of women in need of support may be potentially useful for diminishing the effects of PPD on the mother and newborn infant.	

Barbadoro, P., Cotichelli, G., Chiatti, C., Simonetti, M., L., Margliano, A., Di Stanislao, F., Prospero, E.	2012	Women & Health	Socio-economic determinants and self-reported depressive symptoms during postpartum period	Estimate the prevalence of postpartum depressive symptoms in Italy.	Descriptive Cross-sectional study.	Italy	5,812 women, pregnant, up to 5 years before the survey	Sequence of findings were difficult. No standardized PPD screening tool included in this study. Data was self-reported by women.	Self administered questionnaire and face to face interview by data collectors. Factors were assessed to determine contributing elements to PPD.	A total of 23.5% or 1,3645 women reported they suffered from Postpartum Depressive symptoms. 20.7% stated to suffer from Baby Blues and 2.8% suffered from PPD. Factors associated with postpartum depression were weight increase >16 kg in pregnancy, undergoing a C-section, and physical problems after delivery. Multiparity was a protect factor in baby blues and PPD	High number women suffering from BB in this population in comparison to PPD. Location of study is Italy.
Bell, A. F., Carter, C. S., Steer, C. D., Golding, J., Davis, J. M., Steffen, A. D., Rubin, L. H., Illiand, T. S., Gregory, S. P., Harris, J. C., Connelly, J. J.	2015	Front Genet	Interaction between oxytocin receptor DNA methylation and genotype is associated with risk of postpartum depression in women without depression in pregnancy	To evaluate the association between the genetic/epigenetic variation in the OXTR gene and PPD. The focus was on SNPs rs53576 and rs2254298 and concurrently measured DNA methylation of OXTR CpG site-934.	Case Controlled Study	Avon, United Kingdom	n=545; Control n=276 and Case n=269; 288 final case/control pairs	The limited number of women with PPD. Women with PPD were matched with women with prenatal depression, another alternative could have been to match with women w/o any depression. Blood samples may be inconsistent and not reflect changes occurring in the brain during pregnancy. Unknown whether OXTR changes in the blood during pregnancy.	The study collected data from self-reported questionnaires during pregnancy. Samples of blood were collected from 7-41 wks. gestation. PPD was screening using the EPDS questionnaire during pregnancy and postnatally. Cutoff score for EPDS is 12 or greater.	Significant interaction between rs53576 genotype, the degrees of methylation of CpG-934 in OXTR, and the present of prenatal depression on PPD. Women w/o depression in pregnancy, but have the rs53576, GG genotype and display high methylation in OXTR are 3 x likely to develop PPD, vs. women with lower methylation levels.	Genetic and epigenetic markers can better predict risk of psychological disorders in the postnatal period, may be considered as part of the evaluation process in the future.
Britton, J. R.	2011	Women Health	Infant temperament and maternal anxiety and depressed mood in the early postpartum period	To study the relationship of infant temperament with maternal anxiety and depressed mood was explored	Descriptive Study-Survey	Colorado	n=296 mothers	Selected sample, low participation rate, w/possible selection bias. No face to face interviews were conducted to classify based on DSM-IV criteria.	Survey's completed by participants were completed prior to discharge and at 1 mo postpartum. The State-Trait Anxiety Inventory (STAI) to measure anxiety and Beck Depression Inventory (BDI) to assess PPD. The Early Infant Temperament Questionnaire (EITQ) was also included.	An association was found between difficult temperament w/ anxiety and depression, emerged very early and independent of other established factors.	Suggestive that parenting interventions to enhance maternal coping w/ a difficulty infant to help improve the infant to acclimate to family and environment. This may also help decrease anxiety and depression expressed in the mother
D'Anna-Hernandez, K. L., Zerbe, G. O., Hunter, S. K., Ross, R. G.	2013	Ment Illn	Paternal psychopathology and maternal depressive symptom trajectory during the first year postpartum	To investigate the effect of paternal psychiatric history on maternal depressive symptoms from birth to 12 months postpartum.	Longitudinal Study	Colorado	n=64 families	Specific types of paternal mental health disorders may be more relevant than others, which was not differentiated in this study. Limited sample size and diagnosis.	Fathers underwent a structured clinical interview based on the DSM-IV to evaluate for psychiatric illnesses. Mother's completed the EPDS tool at 1, 6, and 12 mos postpartum with a cutoff score of 13 or greater.	31 out of 64 fathers were classified as an axis I diagnosis using the SCID at the mean of 20.8 weeks postpartum. 13 out of 64 mothers met the diagnosis for substance abuse (20.3% of mothers vs 48.4% in fathers). Fathers with a hx of substance abuse related diagnosis reflected a higher progressive increase in the mother's depression vs fathers with mood-related illnesses. Thus, fathers with substance abuse may not provide mothers with social support, which is a high predictor of PPD.	Women with partners w/ substance abuse disorder had an increasing maternal depression sx trajectory over the 1st year postpartum. Closer evaluation of fathers involvement and paternal mental health status.
de Oliveira Brito, C. N., Alves, S. V., Lademir, A. B., de Araujo, T. V.	2015	Rev Saude Publica	Postpartum depression among women with unintended pregnancy	Analyze the association between unintended pregnancy and PPD	Prospective Cohort Study	Northeastern, Brazil	n=1121 pregnant women, ages 18-49 years old	Sample consisted on low-income women, can't generalize finding.	In Brazil, between 2005-2006 Interview from during pregnancy and post delivery. EPDS scale used to screen for PPD.	60.2 % w/ unintended pregnancies. 25.9% with PPD. Women w/ unintended pregnancy. Higher chance of PPD.	High values on the EPDS results from unintended pregnancy.
Denis, A., Ponsin, M., Callahan, S.	2011	Journal of Reproductive & Infant Psychology	The relationship between maternal self-esteem, maternal competence, infant temperament and post-partum blues	To evaluate the link between infant temperament, maternal cognitions, and post-partum blues.	Correlational Study	Southern France	n=69 women aged 19-41 years old.	Small sample size w/ effects on statistical analysis. Participants were evaluated for postpartum blues at 2 days vs normal 3 days. The term infant temperament is variable and not able to establish causality.	At 2 days postpartum, women completed the EPDS screening tool, with a cutoff of 9. Maternal self-esteem was evaluated by the Maternal Self-Report Inventory (MSI). Mother and Baby Scale (MABS) was used for maternal competency and infant temperament.	Mean score of participants on the EPDS was 11.47, about 27.54% had scores equal or more than 9 on the EPDS, suggestive of baby blues. One correlation found the higher the EPDS scores, the lower the MSI scores. None of the variables, maternal self-esteem or feelings of competency were shown to be significant predictors of Postpartum blues vs. The perception of the baby being "difficult" was positively correlated to depressive symptoms.	High levels of postpartum blues at 2 days, could be the study evaluated too early. Infant temperament is a factor that should be considered when assessing for PPD.

Dennis, Cindy-Lee, Dowse, Therese	2013	Cochrane Database of Systematic Reviews	Psychosocial and psychological interventions for preventing postpartum depression	To assess the psychosocial and psychological interventions compared with usually antepartum, intrapartum, or postpartum care to reduce the risk of developing post-partum depression	All published and unpublished randomized controlled trials of acceptable quality comparing psychosocial or psychological intervention with usual antenatal, intrapartum, or postpartum care from Cochrane Literature Review	N/A	Pregnant women and new mothers (<6 wks. post partum), with no known risks and those at risk for developing PPD. More than 20% of participants were depressed at trial entry were excluded.	All studies were evaluated for risk bias and judgments were made on behalf of the study.	Searched Cochrane Pregnancy & Childbirth Group Trials (Nov 2011).	Significant reduction of women who develop postpartum depression. Interventions included provision of intensive, professionally-based postpartum home visits, telephone based peer support, and interpersonal psychotherapy.	Article about interventions during and after children birth to decrease PPD.
Dietz, L. J., Jennings, K. D., Kelley, S. A., Marshal, M.	2009	J Clin Child Adolesc Psychol	Maternal depression, paternal psychopathology, and toddlers' behavior problems	To study the effects of maternal depression in the postpartum period on the later behavior problems of toddlers and if this relationship was moderated by paternal psychopathology in toddlers lives or mediated by maternal parenting behavior's observed in mother-child interactions.	Longitudinal Design Study	Pittsburgh, Pennsylvania	n=101 mothers-toddler dyads participated in this study.	Maternal reporting was utilized and could be a potential bias in the collected data. This study may overestimate the negative effects of PPD. Sample consisted of mother's with high levels of education and middle to high socioeconomic status, resulting in tx of depression.	Data collected at 18 (T1), 25 (T2), and 34 (T3) months of age. First mother's were interviewed with DSM-IV (SCID-IV) interview, then 5 min teaching task was videotaped w/toddlers. This entire process was repeated at each time. At T3, fathers were interviewed using the Family Informant Schedule and Criteria for DSM-IV. Mother's also assessed father's symptoms of depression.	51 mothers had experienced clinical depression, whereas 50 had never had depression. Of the 51 mothers, 75.5% had experienced onset of their depressive episode within first 6 mos. From 7-12 mos, 11.8%, and 13-18 mos, 13.7%. Treatment of PPD, 13% had psychotherapy only, 11% chose antidepressant meds, and 76% with combined treatment (therapy and rx). Total of 7 (14%) were hospitalized for inpatient psychiatric tx. 27% of toddler's fathers met the dx of at least 1 psychiatric disorder. Highest scores of toddler behavior problems is from maternal depression and paternal psychopathology.	Crucial finding that PPD most prominent within the first 6 months postpartum. Early intervention is necessary to minimize the toddler's risk for later behavioral problems. Parent training programs a possibility for these parents.
Farr, Sherry L., Denk, Charles E., Dahms, Elizabeth W., and Dietz, Patricia M.	2014	Journal of Women's Health	Evaluating Universal Education and Screening for Postpartum Depression Using Population-Based Data	To evaluate prenatal education and screening at delivery, estimate the prevalence of Postpartum depressive sx, and identify venues where additional screening and education are needed.	Descriptive Study- Surveys	New Jersey	n=2,391	Data not provided from 11 hospitals though the state, may not generalize to all New Jersey mothers. No data available from postpartum visit on prevalence of depression.	Women who delivered infants from 2009-2010 in New Jersey. Data from EPDS scores linked to Pregnancy Risk Assessment Monitoring (PRAMS). PRAMS mailed to women 2-3 months post delivery.	Two-thirds reported awareness of depression from PCP. 89% screening for PPD at delivery. 13 % of women screening positive for PPD at delivery. 7% of women who screened negative, then screen positive between 2-8 months postpartum.	New Jersey law that mandates prenatal education on depression and screening for depressive sx at hospital delivery.
Gaillard, Adeline, Le Strat, Yann, Mandelbroot, Laurent, Keta, Hawa, Dubertret, Caroline	2014	Psychiatry Research	Predictors of postpartum depression: Prospective study of 264 women followed during pregnancy and postpartum	To identify sociodemographic, psychosocial, and obstetrical risk factors of PPD in a middle class community sample and to test whether these factors are r/t PPD.	Prospective cohort study	France	n=264 pregnant women w/ mean average age of 31 years old	EPDS as a self-reported tool can overestimate the rate of PPD. Social support, life stressors, hx of depression, and family hx of depression have not been assessed. Attrition rate is low. Possible selection rate bias.	Data collection wave #1 between 32-41 weeks, and a second time wave #2, between 6-8 weeks postpartum. Screening took place using the EPDS French version. Cutoff score was 12 or greater out of total of 30 points. Confirmation of EPDS scores greater or equal to 12 were done by a psychiatrist via telephone interview, using the Diagnostic Interview for Genetic Studies, for major depression dx. Background data collected w/ EPDS and checked via medical records.	Of the 264, 44 (16.7%) had PPD and 44 (16.7%) with antenatal depression. Total of 19 (7.2%) with both antenatal and PPD. Risk factors found to contribute to PPD were antenatal depression, past or present physical abuse by the partner, and migrant status. Women w/postpartum physical complications in the first 2 mos after delivery were at risk of PPD.	These traits found in study are valid points that providers need to view as risk factors for PPD. These can be screening markers for PPD.
Giannandrea, Stephanie A. M., Cerulli, Catherine, Anson, Elizabeth, Chandron, Linda H.	2013	Journal of Women's Health	Increased Risk for Postpartum Psychiatric Disorders Among Women with Past Pregnancy Loss	Evaluated the risk factors for PPD in women w/ or w/o prior pregnancy loss, and rates of these disorders in women with one vs. multiple pregnancy losses	Re-analysis of Initial data from a cross sectional study	Rochester, New York	n=192, > 18 yrs. old, infants <14 mos; n=98 w/o hx of pregnancy loss, n=94 w/ at least 1 previous loss of pregnancy	Each participant was interviewed at only 1 point, thus not longitudinal. Previous pregnancy loss gathered from women, not confirmed by medical records. Timing to psychiatric sx were not assess r/t pregnancy loss or losses.	Each participant underwent evaluation by psychologist, using semi-structured interview designed (SCID) to detect 33 DSM-IV current Axis I dx.	Women with hx of pregnancy loss with greater chance of dx. for major depression, than women w/o. Women with multiple losses increase change of dx. of major depression or post-traumatic stress disorder. 37% met criteria for major depression, 56% met for major or minor depression at time of interview	Loss is a risk factor that is r/t PPD. This sample had a large prevalence of depression.

Gjerdengen, D., Crow, S., McGovern, P., Miner, M. and Center, B.	2009	Ann Fam Med	Postpartum depression screening at well-child visits: validity of a 2-question screen and the PHQ-9	Investigate the validity of a 2-question screen and the 9 item PHQ-9 for identifying PPD and the feasibility of screening for PPD during well visits.	Randomized Controlled Study	Minneapolis and St. Paul, Minnesota	n=506 women	Modest initial participation rate. No comparison in this study made from the PHQ-9 to the EPDS tool.	Initial and follow up questionnaires both included 2 depression screening tools. The SCID was completed 0-1 month postpartum and again if no hx of depression, but screened +. SCID interviews were the reference standard completed by doctoral level psych students.	Total of 20 women (4.6%) dx with major depression at 0-1 month, and 45 (8.9%) dx of major depression over the entire study. Sensitivity (100%) was seen with the 2-question screen and the highest specificity (94%) was seen with the PHQ-9. Negative predictive value was high 97-100% and positive predictive value 15-43% was modest over 0-9 months postpartum. Two stage screener testing was validated and time saving in primary care clinic.	Good option to start off with the 2 question PHQ, then if positive administer the PHQ-9 in it's entirety. High compliance rate of completing questionnaire in pediatric clinic vs. family practice clinic.
Grusso, Pietro-Quattraro, Rosa Maria	2015	Psychology, Health & Medicine	Routine screening for postnatal depression in a public health family service unit: A retrospective study of self-excluding women	To evaluate the socio-demographic and psychosocial factors of women who withdraw from Postnatal depression screening.	A retrospective descriptive study	Italy	A total of 525 women attending an antenatal class in Italy.	Sample did not represent general population- was pre-selected for those attending the classes. Data all from self-reported tools. Lack of follow up to verify actual elements.	A total of 346 (65.9%) women successfully completed the entire program. A total of 179 women withdrew (34.1%).	Results showed that 1 in 3 women do not complete a course of screening for Postnatal Depression. The group that withdrew showed high level of marital dissatisfaction and unemployment as a stressful event.	If marital dissatisfaction or unemployment is present, these women are at risk for postnatal depression and may tend to withdraw from screenings.
Hanington, L., Heron, J., Stein, A., Ramchandani, P.	2012	Child Care Health Dev	Parental depression and child outcomes--is marital conflict the missing link?	To investigate the influences of parental PPD and marital conflict on a child's outcomes. To evaluate the 2 types of antenatal stress.	Longitudinal Cohort Study	England	Mothers n=11,954 and fathers n=9,846 in the antenatal period. Mothers n=11,198 and fathers n=7090 in the postnatal period.	Lower response rate from fathers vs mothers. Potential for rater bias if mother's were depressed, lower scores were possible.	Mothers and fathers completed the EPDS @ 18 wks and 8 mos postpartum. Cutoff scores of 12 or greater were applied, with participant classified as depressed. Marital conflict was assessed w a 9-item scale. Child outcomes were assessed when the child was age 42 mos.	In the antenatal period, 13.8% of mother were classed as depressed, compared with 4% of fathers. In the postnatal period, 8.8% were classed as depressed, and only 2.9% of fathers were classed as depressed. 360 mothers and 59 fathers were depressed at both points. Rates of depression higher in mothers than fathers. Both mothers and fathers reported marital conflict more than 50% higher in the postnatal phase than antenatal. Strong evidence demonstrated maternal and paternal postnatal depression predicted child problems @ age 42 months. When marital conflict was included, association between depression & total problems was attenuated for mothers about 25% and fathers 17.6%.	Parental PPD is associated with adverse child outcomes, more so mothers. More marital conflict after the delivery than prior. Both marital problems & depression in the antenatal period =increased problems for the child at 42 mos, with the possibility of later conduct difficulties.
Hanna, B., Jarman, H., Savage, S.	2004	International Journal of Nursing Practice	The clinical application of three screening tools for recognizing post-partum depression	To evaluate the clinical application of three screening tools for early recognition of PPD. The tools are Postpartum Depression Prediction Inventory (PDDI), the Postpartum Depression Screening Scale (PDSS), and the Edinburgh Postnatal Depression Scale (EPDS).	Descriptive Study- Surveys	Victoria, Australia	Sample of women n=107 during prenatal period at 28 weeks gestation. Then at 8 weeks postnatal n=84 women. All women were > 20 years old and english speaking.	Challenges when comparing prenatal and postnatal scores. This study left out 1 question on the EPDS postnatally, decreasing the reliability of the tool.	Data was collected from prenatal visit at 28 weeks gestation using PDDI tool. At the 8 weeks postpartum visit, women completed the EPDS and PDSS screening tools as well as the PDDI completed by a nurse. All visits were completed by midwives.	Results showed 17% of women with PPD and 10-15% with major PPD. Both the EPDS and the PDSS were statistically correlated. The PDDI identified 8 women at risk, 7 received anticipatory guidance and 5 received counseling.	Both the EPDS and the PDSS identified the same 8 women with PPD, scoring significantly high on both tools. Strong correlation found using the PDDI with the PDSS and EPDS. The checklist was a quick and reliable tool that identified at risk women for PPD and allowed midwife to provide anticipatory guidance/counseling.
Hanusa, B. H., Scholle, S. H., Haskett, R. F., Spadaro, K., Wisner, K. L.	2008	J Women's Health (Larchmt)	Screening for depression in the postpartum period: a comparison of three instruments	Comparison of the effectiveness of three screening tools. The Edinburgh Postnatal Depression Scale (EPDS), Patient Health Questionnaire (PHQ-9), and the Postpartum Depression Screening Scale (PDSS)	Correlational Study- no randomization or control group	Western Pennsylvania	n=123 sample of mothers > 18 years old w/ infants delivered 6-8 weeks prior.	Small sample of women w/ the same insurance health plan administered in random order. Screenings tests were not administered in random order. Interviews were only conducted on participants with + results.	Three screening tools were conducted via telephone, within 6-8 weeks postpartum. Tools were administered in the order-EPDS, PHQ-9, and PDSS. If negative screen, a repeat was conducted at 3 mos and 6 mos to detect emergent sx. If positive screening, mother's were asked to participate in a home visit by a nurse to confirm diagnosis of major depressive disorder if initial screening tool was positive.	Findings of 2% to 36% of women had high levels of depressive symptoms at 6-8 weeks after delivery. Of these 123 women, 29 had home visits (24%) and 13 (11%) had MDD in 6 mos after delivery. Of the 3 screening tools, the EPDS and PDSS were significantly more accurate than the PHQ-9. Telephone screening for PPD at 6-8 weeks postpartum is time-efficient, well received method to identify women at risk for MDD.	EPDS better than PHQ-9 and PDSS.

Hayakawa, N., Koide, T., Okada, T., Murase, S., Aleksic, S., Furumura, B., Furumura, K., Shimo, T., Nakamura, Y., Tamaji, A., Ishikawa, N., Ohoka, H., Usui, H., Banno, N., Morita, T., Goto, S., Kanai, A., Masuda, T., Ozaki, N.	2012	PLoS One	The postpartum depressive state in relation to perceived rearing: a prospective cohort study	To examine the perceived rearing (own memories of being raised) is a risk factor for PPD as measured by the EPDS and whether the score of perceived rearing is affected by depressive mood.	Prospective Cohort Study	Nagoya, Japan	n=448 pregnant women were randomly sampled in a prenatal class	The mental states of the participants were only assessed via self-reported questionnaire via EPDS tool. The EPDS is not meant to classify depression. Cutoff score of 9 used for the EPDS, (sensitivity around 77%, specificity 69%).	EPDS and Parent Bonding Instrument (PBI) were collected at T1: early pregnancy prior to the 25th week of pregnancy, or late pregnancy, around the 36th week. And T2- 1 month after delivery.	No significant difference in perceived rearing in the non-depressed group and postpartum depressive group, therefore not a strong risk factor for PPD.	No significant risk or link found with perceived rearing as a risk factor for PPD.
Horowitz, J. A., Murphy, C. A., Gregory, K. E., Wojcik, J.	2011	J Obstet Gynecol Neonatal Nurs	A community-based screening initiative to identify mothers at risk for postpartum depression	To conduct a community based postpartum depression (PPD) screening initiative and recommended PPD screening practices	Descriptive Correlational	Boston, Massachusetts	n=5,169 Postpartum women aged 14-49 years old.	Unable to follow up on mothers with +ppd screen of EPDS > or equal to 13 and decline interview. Population for this study may have occurred out of convenience.	Mothers were screened at 4-6 wks postpartum via mail or telephone for PPD using the EPDS. Follow-up SCID Interview was offered for any mother with EPDS > or equal to 10 to confirm PPD.	From sample of 5,169, 674 or 13% met criteria for PPD with EPDS scores of > or equal to 10. There were 185 mothers with elevated EPDS scores, and 144 diagnosed with minor or major depression. Increased PPD were not associated with parity or age. Higher PPD scores were attributed with less than high school education and race/ethnicity other than white.	Minorities at increased risk and low education level. Findings of 13% consistent with overall PPD rates.
Howell, E. A., Bodnar-Deren, S., Balberz, A., Loudon, H., Mora, P. A., Zlotnick, C., Wang, J., Leventhal, H.	2014	Arch Women's Ment Health	An intervention to reduce postpartum depressive symptoms: a randomized controlled trial	Are one or more of the three subsets of depressive symptoms, somatic, mood, and self-critical component, could be triggered and moderated by a situational stimuli, and if an intervention designed to normalize postpartum experience lower these rates of the symptoms	Randomized controlled trial	East Harlem, New York City	540 predominantly white, high incomes mothers in a randomized trial.	Lower rates of + depression symptoms screens. Depression screening tool used versus interview technique. This study was done at only 1 site, with educated and white women.	Participants were surveyed prior to the randomization, 3 wks, 3 mos, and 6 mos postpartum. 2-step intervention program versus the control arm received enhanced usual care. Depressive symptoms were evaluated with the Edinburgh of 10 or >.	The current study concluded the educational intervention did not decrease ppd in this sample of highly educated and mostly white mothers since their underlying prevalence was low. However, the intervention was positive for decreased PPD in black and latina mothers.	Possible high incidence of PPD in racial minorities. Behavioral inter. Program not a significant factor with white mothers.
Jardri, R., Pelta, J., Maron, M., Thomas, P., Delion, P., Codaccioni, X., and Goudemand, M.	2006	J Affect Disord	Predictive validation study of the Edinburgh Postnatal Depression Scale in the first week after delivery and risk analysis for postnatal depression	The aim of this study is to validate the use of the EPDS in early postpartum and identify risk factors for postnatal depression.	Experimental design- Naturalistic study	France	n=815 women, who gave birth during the study period.	Prevalence of depression in this study low. Naturalistic approach in this study utilized. Many women lost to follow up in this study.	Participants completed the French Version EPDS screening tool between the 3rd-5th day postpartum. Cutoff score of 9.5 out of 30 was applied. Two study groups were made: Group #1: women > than 8 on EPDS. Group #2: control group w/randomization, of the same number of women, with scores <8 on EPDS. At 8 wks postpartum, 2 mds conducted DSM-IV interview via telephone to dx depression.	At Day 3-5 postpartum, women later dx with major depression scored higher on the EPDS initially than minor or those w/o PPD. At 8 wks postpartum, prevalence was 8.7% for major depression and 7.4% for minor depression. EPDS validated for usage during early postpartum 3-5 days. The negative predictive value (NPV) was high at 95.2%, and the positive predictive value (PPV) was low at 42.8%. Risk factors for PPD include previous hx of depression, unemployment, premature delivery of stopping breastfeeding in the first month for non-medical reasons.	This study recommended early screening using the EPDS in the 3-5 days postpartum as if not screened, many women would be lost to f/u and PPD would not be dx. Integrated medical team of MDs, RNs, psychiatric team and social support should be encouraged as tertiary preventions.
Kamalifard, M., Hasaspoor, S., Babapour Kherodini, J., Panahi, S., Bayati Payan, S.	2014	J Caring Sci	Relationship between Fathers' Depression and Perceived Social Support and Stress in Postpartum Period	To evaluate the paternal postpartum depression and the relationship with perceived stress and social support components.	Descriptive Study- cross sectional design	Tehran, Iran	n=205 fathers from 6-12 weeks postpartum	Design of study did not allow to evaluate the cause and effect relationship of this study. Study was conducted in the winter, possibly contributing to bias results. Results unable to generalize to entire country of Iran due to sample population.	Three study screening tools were included, the EPDS-cutoff score of 12, the Cohen's Perceived Stress Scale (PSS), and the Multidimensional Scale of Perceived Social Support (MSPSS).	The mean age of the fathers, 32.3 years old. The result of PPD in this group of fathers was 11.7% who scored 12 or high on the EPDS. The majority of fathers reports moderate social support, 69.8%, with 18% reporting high support, and 12.2% has low social support. A direct relationship between PPD and father's perceived stress scores. Overall father's with lower social support had perceived higher stress.	Results indicate the need to study PPD in fathers and attempting to reduce their stress after delivery. Public awareness of this issue is necessary.

Katon, Wayne, Russo, Joan and Gavin, Amelia	2014	Journal of Women's Health	Predictors of Postpartum Depression	Examine sociodemographic factors, pregnancy associated psychosocial stress/depression, health risk behaviors, pre-pregnancy medical and psychiatric illness, pregnancy related illness, and birth outcomes as risk factors for PPD	Prospective Cohort Study	Seattle, Washington	n=1423 women	Study only from 1 clinic in a specific area in the US, lack of psych to dx with DSM IV, and failed to assess BMI or social support.	Screening in pregnancy at 4mo and 8mo at a university high risk obstetric clinic using the PHQ-9. Follow up screen at 6 wk postpartum.	Women with PPD were younger, more likely unemployed, has more pregnancy associated depressive symptoms, and psychosocial stress/ high incidence of smokers and taking antidepressants in pregnancy. This findings also showed less alcohol intake during pregnancy.	Screening at 6 wk postpartum may be too early, and missed the 3 month time period window.
Kerstin, B.;Aarits, C.;Tillman, C.;Persson, H.;Engstrom, G.;Edlund, B.;Ohrvik, J.;Sylvén, S.;Skalkidou, A.	2015	Arch Women's Ment Health	Association between parental depressive symptoms and impaired bonding with the infant	Evaluate associations between maternal and paternal depressive sx and impaired bonding with their infant. Secondly aim to evaluate the association between parents' marital problems and impaired bonding with the infant.	Population-based cohort study	Uppsala, Sweden	n=727 couples from may 2006-June 2007.	Lower self-reported bonding and parenting skills may have been noted if parent is depressed. Overall lower prevalence of depression sx in bother mothers and fathers, any be related to parents having to complete and return the questionnaires at 6 wks. and 6 mos.	All couples completed the EPDS was completed at 6 weeks and 6 mos postpartum, then the Postpartum Bonding Questionnaire (PBQ) factor 1 at 6 mos. All questionnaires completed by mail.	Mothers with higher EPDS scores than fathers. Father's scores on the PBQ for factor 1, 2, and 3. Both mother's and fathers EPDS scores were higher at 6 wks. than 6 mos. Finding that depressive sx in both parents at 6 wks. are associated w/ impaired bonding with the infant at 6 mos. Marital relationship deterioration was associated with impaired bonding. Men were less likely to bond with their infant d/t marital deterioration.	Men's depression may be different from women's requiring a different questionnaire for screening, rather than the common EPDS.
Khalifa, D. S.;Ghavin, K.;Bjertness, E.;Lien, L.	2015	Int J Womens Health	Postnatal depression among Sudanese women: prevalence and validation of the Edinburgh Postnatal Depression Scale at 3 months postpartum	To investigate the 3 mos prevalence of postnatal depression and validates the EPDS against the Mini-International Neuropsychiatric Interview (MINI)	Descriptive Study- Cross Sectional Design	Khartoum, Sudan	n=238 Sudanese women, in the 2nd or 3rd trimester of any parity.	Possible risk of sample bias with underestimated or overestimated prevalence of postnatal depression. First study to evaluate depression in women in Sudan. Entire sample was not interviewed using the MINI, only those that were tested positive, causing possible bias.	During the first interview, T0, all women were assessed for demographic data as well as satisfaction on specific issues. The second interview T2, occurred @ 3 mos postpartum, either face-to-face or telephone interview. The first EPDS was completed. If a mother was tested positive, she was matched with a negative tested mother based on date of birth of the infant. These mother's then went on to get the MINI evaluation within 1 week post-EPDS, by a clinical psychologist blind to the EPDS score.	With a cutoff of greater or equal to 12, the prevalence in this sample of postnatal depression at 3 mos was 9.2%, with a total of 22 women with scores greater or equal to 12 in the EPDS. The use of the EPDS in Sudanese women in an urban setting had good validity and can help identify women at risk for PPD.	EPDS would found to be easy to administer and understood. Women who refused were concerned about the stigma about classified as depressed. The recommendation is to train health personnel that work at the community level who are the first contact for many of these women during the postpartum visit.
Lavender, Tina;Richens, Yana;Milan Stephen, J.;Smyth Rebecca, M. D.;Dowdwell, Therese	2013	Cochrane Database of Systematic Reviews	Telephone support for women during pregnancy and the first six weeks postpartum	Assess the effects of telephone support with pregnancy and during the first six weeks, compared with routine care, on both mother and baby. The second objective is to compare the different types of telephone support on mother and baby.	Cochran Literature Review from all published and unpublished randomized control studies and cluster randomized trials.	N/A	Pregnant women and postnatal women in the first 6 weeks post birth	Mixed methodological quality studies.	Searched Cochrane Pregnancy and Childbirth Groups Trials Register (Jan 2013). Randomized controlled trials 27 involving 12, 256 women.	Minimal benefits regarding reduced depression scores, BF duration, and increased overall satisfaction, not strong enough data.	Article about telephone calls in postpartum.
Logsdon, M. C. and Myers, J. A.	2010	Journal of Women's Health	Comparative performance of two depression screening instruments in adolescent mothers	Comparison of two screening instruments which best predicts a diagnosis of PPD in adolescent mothers	Randomized Controlled Study	Southern United States	n=59 adolescent teen mothers	Only one site for data collection	In random order, 3 depression screening instruments were completed. Then each mother was interviewed in private by a psychiatric mentation health clinical nurse specialist or psychologist, who were blind to depression screening scores and study aims.	Total 16.9 % of adolescent mothers were diagnosed as depressed. The EPDS achieved the best performance measure in adolescent mothers to identify PPD. No depression screening tool scores correlated to diagnostic evaluation.	Considerations may need to be made for adolescent mothers when screening for PPD, lower cutoff scores. EPDS captures both depression and anxiety.
Maimburg, R. D.;Vaeth, M.	2015	Sex Reprod Healthc	Postpartum depression among first-time mothers - results from a parallel randomized trial	Comparison of the risk of PPD among nulliparous women enrolled in a structured antenatal programs versus receiving standard care	Randomized Controlled Study	Denmark	n=1193 pregnant Danish women	Prevalence of women with EPDS score greater or equal to 12 was lower than expected. Program did not include postpartum course sessions. The EPDS was utilized w/o follow up interview.	Data collection from early pregnancy and at 6 weeks postpartum. The EPDS was utilized to screen for PPD with a cutoff score of 12 or greater	Total of 7.5% of nulliparous women w/ EPDS score of 12 or greater. Women who never breastfed or did not breastfed their children 6 wks. after birth had a high risk of PPD. The short antenatal education program during pregnancy did not significantly change the number of women at risk for PPD.	Critical life experiences prior to parent hood increased PPD risk. Six fold increase in PPD found in women who gave birth prior to 30 wks. Low cigars and C-section doubled the risk of PPD. Length of stay in this study 5 days in postnatal ward.)

Martins Cde, S.;Motta, J. V.;Quevedo, L. A.;Matos, M. B.;Pinheiro, K. A.;Souza, L. D.;Silva, R. A.;Pinheiro, R. T.;Coelho, F. M.	2015	J Affect Disord	Comparison of two instruments to track depression symptoms during pregnancy in a sample of pregnant teenagers in Southern Brazil	Evaluate the best cutoff points for the Edinburgh Postnatal Depression Scale (EPDS) and the Beck Depression Inventory (BDI) is a sample of pregnancy adolescents.	Cross-Sectional Design Study	Pelotas, RS, Southern Brazil	N=807 pregnant adolescents who were ages 13-19 years old, in the 2nd trimester	Sample consisted of majority of middle to low income adolescents and was performed only with pregnant women in the 2nd trimester. Both screening tools not specifically direct for teens	During the 2nd trimester, participants completed the 2 self-reported screening tools and a MINI clinical interview for identification of depression.	The best cutoff for the EPDS was 10 or greater, with a sensitivity of 81.1% and specificity of 82.7%. For the BDI, the best cutoff was 11 or greater, with a sensitivity of 86.7% and specificity of 73.8%. While using the MINI interview, 17.7% among pregnant teens had a major depressive episode, whereas 26.6% showed depression with only the EPDS of cutoff score of 10 or greater.	Different cutoff points on the EPDS can be affected by ethnic differences, gestational age differences, average age of the sample, and parity status.
Matijasevich, A.;Munhoz, T. N.;Tavarez, B. F.;Barbosa, A. P.;da Silva, D. M.;Abitante, M. S.;Dall'Agnol, T. A.;Santos, I. S.	2014	BMC Psychiatry	Validation of the Edinburgh Postnatal Depression Scale (EPDS) for screening of major depressive episode among adults from the general population	Assess the validity of the Edinburgh Postnatal Depression Scale (EPDS) as a screening instrument for Major Depressive Episode among adults from the general population, outside of the postpartum period.	Descriptive cross-sectional	Pelotas, Brazil	Validation study only on adults = or > than 20 years. Participants with hx of institutionalization were excluded. Sample was selected from weekly interviews, 1 in 3 households were included in the main study, randomly selected. Total of 533 selected for gold standard interview, 84% participation rate, sample=447 adults. Total 191 men and 256 women included in the sample	Screening tool was administered in a face-to face interview, possibly causing bias in the participants responses. A gap between EPDS screening tool and gold standard of 17 days, causing changes in depressive symptoms.	Interviews w/mental health professionals were conducted about 17 days after the completion of the EPDS. The gold standard instrument was the Mini International Neuropsychiatric Interview (MINI)	40 individuals w/MDE, correlating to global prevalence of MDE of 8.9%. Sensitivity decreased with the cutoff increasing. The specificity between 2 cutoff points increased from 60.7% to 71.3%, overall > or = 8 cutoff was suitable for this population. Total of 85 individuals with scores > or = in EPDS. The EPDS is suitable to screen for MDE in adults from the community/urban area.	EPDS is a validated screening tool, can be used to monitor MDE prevalence
Morikawa, M.;Okada, T.;Ando, M.;Aleksic, B.;Kunimoto, S.;Nakamura, Y.;Kubota, C.;Uino, Y.;Tamaai, A.;Hayakawa, N.;Furumura, K.;Shino, T.;Morita, T.;Ishikawa, N.;Ohoka, H.;Usui, H.;Banno, N.;Murose, S.;Goto, S.;Kanai, A.;Masuda, T.;Ozaki, N.	2015	Sci Rep	Relationship between social support during pregnancy and postpartum depressive state: a prospective cohort study	To evaluate the association between social support and PPD	Prospective cohort study	Nagoya, Japan	n=877 pregnant women	Depressive states was defined by EPDS and clinical interviews were not conducted by psychiatrists. Not all factors associated with PPD were included in this study.	Participants completed the Japanese version of social support questionnaire (J-SSQ) and EPDS in early pregnancy, 1 and a one month postpartum, 12.	Fewer available support persons during pregnancy can have a negative impact on PPD. Women with prepartum and postpartum depression had fewer supportive persons and lower satisfaction w/ social support they received. Larger amount of social support has a greater protective effect. Primiparous women high risk for PPD than multiparous women.	Very important study that made lead to preventive factors of PPD= large social support during pregnancy.
Nishimura, A.;Fujita, Y.;Katsuta, M.;Ishihara, A.;Ohashi, K.	2015	BMC Pregnancy Childbirth	Paternal postnatal depression in Japan: an investigation of correlated factors including relationship with a partner	To examine the prevalence and factors contributing to paternal postnatal depression and 4 mos.	Descriptive Study-cross sectional design	Kobe City, Japan	n=807 couples were mailed the EPDS.	Difficult to clarify causal relationship with the many factors in this study design. Both mothers and fathers were mailed the questionnaire simultaneously, discussions could have been present among both parties. Low response rate in this study. No diagnostic interviews were conducted to validate the EPDS scores.	The EPDS was distributed to couples with a 4 mo infant. Cutoff score of 8 or > for men, and 9 or > for women.	The incidence of depression at four months after childbirth was 13.6% in father's. Maternal depression and low marital relationship satisfaction were significantly correlated w/ PPD in fathers. Experience visiting a medical institution d't mental problem was the stronger predictor for fathers.	Other correlated factors found in this study was hx of infertility tx and economic anxiety.

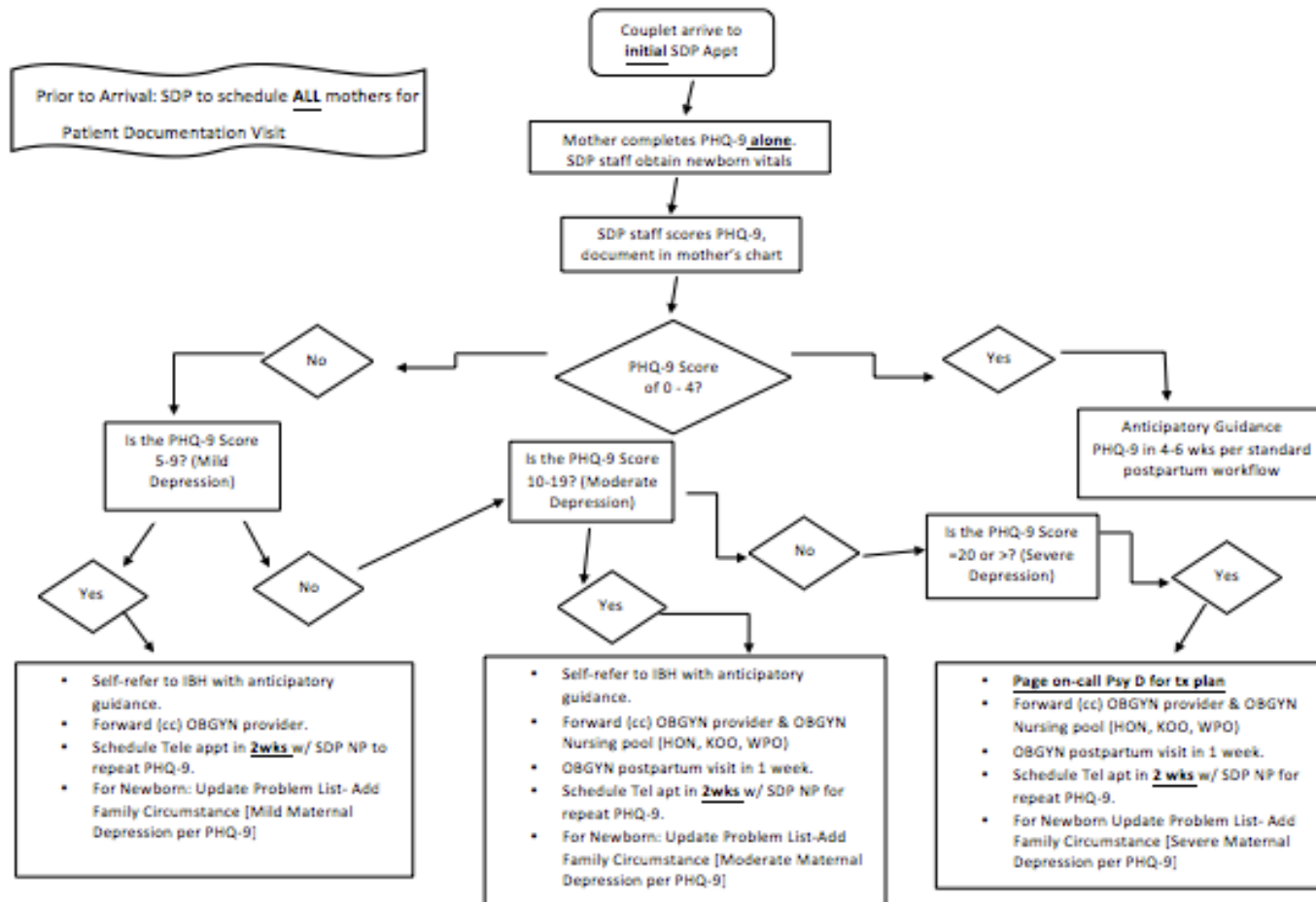
Pearson, R, M.,Evans, J.,Kounali, D.,Lewis, G.,Heron, J.,Ramchandani, P, G.,O'Connor, T, G.,Stein, A.	2013	JAMA Psychiatry	Maternal depression during pregnancy and the postnatal period: risks and possible mechanisms for offspring depression at age 18 years	To evaluate the link between antenatal and postnatal depression w/ offspring depression.	Prospective cohort study	United Kingdom	n=8937 antenatal and postnatal parents. N= 4,566 adolescent offspring at age 18. Overall sample was n=2847.	Adolescents who attended at 18 year, came from high SES. There was no measurement of maternal depression when the adolescent was assessed at age 18.	The EPDS was administered at 18 wks and 32 weeks antenatally. Then at 8 wks and 8 mos postpartum. Depression in the offspring at 18 yrs old was completed by the Clinical Interview Schedule Revised (CIS-R).	EPDS scores > or = 12 in the antenatal phase is 12% and postnatally 7%. 8% of the adolescents at age 18 yrs old were diagnosed with depression. Positive correlation of mother's with depression in the antenatal and postnatal period were positive depression in offspring at age 18. Mothers with low education were found to have the greatest risk for postnatal depression and depression in the offspring.	Treating depression in pregnancy is effective for minimizing offspring depression later in life. Education level of the mother seems to be a factor possibly r/t treatment and awareness.
Petrozzi, A.,Gagliardi, L.	2013	J Perinat Med	Anxious and depressive components of Edinburgh Postnatal Depression Scale in maternal postpartum psychological problems	To investigate the Edinburgh Postnatal Depression Scale given immediately after delivery and which factors increase the high EPDS scores 3 months later	A cohort study	Italy	n= 594 mothers.	Refining use of the EPDS would be beneficial whereas initially women are anxiety following delivery versus depression.	Mothers completed the Italian version of the EPDS at two selected stages: 2-3 days post delivery while in the hospital and 3 mos per telephone interview. Cutoff point for this study was 9, which considered women at risk for PPD.	EPDS scores immediately after delivery were significantly higher than at 3 mos, possibly due to presence of "baby blues" related to anxiety during the immediate phase after delivery. EPDS identified 3 factors, depression, anxiety, and anhedonia.	EPDS can be used immediate and good indicator for anxiety=baby blues immediately after deliver.
Ramchandani, P, G.,Psychogiou, L.,Vlachos, H.,Iles, J.,Sethna, V.,Neils, E.,Lodder, A.	2011	Depress Anxiety	Paternal depression: an examination of its links with father, child and family functioning in the postnatal period	Investigate the association between paternal depressive disorder and family and child functioning during the first 3 mos of a child's life.	Case Controlled Study	United Kingdom	Sample of fathers w/ depression, n=54, and a group without depression, n=99. Fathers were > 18 years old and spoke fluent English.	Sample size modest. Data reported were from similar time points. Assessment of couple disharmony was done by parental questionnaire.	The EPDS was completed by fathers at 7 weeks, cutoff was 10 or >. When the infant was 3 mos, couples were interviewed using the SCID to determine if they met criteria for major depressive disorder.	About 12.7% of the sample scored 10 or > on the EPDS. Father's in the depression group reported higher levels of dissatisfaction, lower levels of affection, and lower levels of relationship satisfaction. There was increased risk for inter-parental conflict in the postnatal period. Fathers in the depressed groups reported infants w/ higher levels of distress.	Serious consideration needed to evaluate the father and mothers for PPD as it affects the marital relationship.
Reck, Corinna;Stehle, Eva;Reinig, Katja;Mundt, Christoph	2009	Journal of Affective Disorders	Maternity blues (MB) as a predictor of DSM-IV depression and anxiety disorders in the first three months postpartum	Does maternity blues significantly predict PPD and anxiety disorders in the first 3 months after delivery.	Prospective, Longitudinal study in Germany	Heideberg & Darmstadt, Germany	n=853 women from 6 clinics, mean age 32.8 yr.	Middle class low risk sample, MB possibly low. Psychosocial variables impact were not evaluated. Initial 2 week screening required participants to recall previous experience for the past 2 wks.	Two weeks post partum, women completed the EPDS and the Anxiety Questionnaire. A telephone interview was conducted using the PHQ-D and Anxiety SCID screening at 2,4,6,8,10 and 12 weeks post partum. If clinically significant results, the structured clinical interview of the DSM IV was conducted	MB was found in 471 out of 853 women. Of the 471 women, 27 developed PPD. Significant finding of MB and development of PPD. Significant finding between MB and SDM IV anxiety disorders. MB determined as a risk factor for PPD in Germany. Prevalence of MB is 55.2%, lasting on average 3-4 days, with 4.3% lasting 10 days.	Relatively low rates of PPD in comparison to the significant finding of MB. Most women in this study with MB, did not necessarily have PPD. MB is an indicator for possibly an underlying anxiety disorder.
Scottish Intercollegiate Guideline Network	2012	NCG	Management of perinatal mood disorders. A national clinical guideline	Evaluate guidelines for perinatal mood disorders	Meta-analysis	N/A	N/A	N/A	N/A	Scottish Intercollegiate Guidelines Network (SIGN) created a systematic review and created guidelines for all perinatal mood disorders screening, interventions and treatment. Created very broad screening guidelines, but very thorough treatment interventions which includes therapy and medication intervention. Limited information regarding prevention.	Very good background and establishes framework for practitioners to follow.
Serhan, N.,Ege, E.,Ayrançi, U.,Kosgeroğlu, N.	2013	J Clin Nurs	Prevalence of postpartum depression in mothers and fathers and its correlates	Evaluate the prevalence of postpartum depression and the connections in a group of mothers and their husbands.	A Descriptive Study: Cross-sectional design	Western Turkey	Total of 110 couples or 220 partners constituted the study group.	Face to face interviews were the source of the data collection, leading to potential bias.	Two questionnaires were administered, the Mother Introduction Form (MIF) and the Father Introduction Form (FIF). The Edinburgh Postpartum Depression Scale. All forms were collected and filled in by researchers from the sample group, using the face-to-face interview.	The study showed postpartum depression was 9.1% for mothers and 1.8% for fathers. Unemployed fathers scored higher on EPDS than working fathers.	Lower PPD rates? Due to cultural differences in Turkey, mother's are the expected primary caregiver.
Sethna, V.,Murray, L.,Neils, E.,Psychogiou, L.,Ramchandani, P, G.	2015	Parent Sci Pract	Paternal Depression in the Postnatal Period and Early Father-Infant Interactions	To investigate the link between paternal depression and father-infant interactions at 3 mos postpartum	Prospective Cohort Study	United Kingdom	n=192 fathers > 18 years old, spoke English, infants born > 37 wks., and birth weight > 2.5 kg	Modest number of fathers with current depression were recruited. Ethnic and socioeconomic composition of the sample may limit generalizability.	Data collection from a face to face interview using the SCID for DSM-IV, at 3 mos postpartum in a home assessment. A observation of father-infant interactions were videotaped following the interview in (2) 3 minute sessions. One session was face-to-face play and the second session with the father-infant in a floor mat play.	Total of 54 fathers met criteria for depression and 99 fathers were categorized as non-depressed. Fathers who met the criteria for depression scored high on the EPDS than non-depressed. In the face to face play, paternal depressive scores were not associated with any father-infant interaction. In the floor-mat setting, fathers with increased EPDS scores were less intrusive, displaying increased negative affects in their interactions.	Fathers were more withdrawn from their infants if suffering from depression Paternal depression is visible differently from maternal PPD.

Shamshiri Milani, H., Azargashb, E., Beyraghi, N., Defaie, S., Asbaghi, T.	2015	Int J Fertil Steril	Effect of Telephone-Based Support on Postpartum Depression: A Randomized Controlled Trial	The effect of health volunteers telephone based -support on PPD.	Randomized controlled trial	Iran	n=203 postpartum women completed the EPDS. Eligible mothers were n=54; n=27 per control and intervention group, via random assignment	Support from family and husband as a factor in PPD, were not included. Timing of PPD screening with EPDS was different than similar studies.	Incidence of PPD was 36.9%, previous studies reported PPD as 23.7% and 32%. Health volunteer telephone based support was effective in decreasing PPD and beneficial in women with mild to moderate levels of PPD symptoms.	Of the 203 mothers who completed the EPDS, 67 (33%) had mild-moderate depression, with 8 (4%) severe depression. The incidence of PPD in this study was 36.9%. The depression scores before intervention in both groups were the same. After the intervention, the mean depression scores in the intervention group who received telephone support had a decrease of EPDS scores r/t the intervention.	The telephone based intervention is cost-effective and proved to be beneficial to decreasing EPDS scores. The telephone based support does not necessary have to be a licensed healthcare worker, could be a volunteer etc. This model of care could possibly reduce the burden of PPD and its severity.
Shrivastava, S. R., Shrivastava, P. S. and Ramasamy, J.	2015	Journal of Neurosciences in Rural Practices	Antenatal and postnatal depression: A public health perspective	Awareness of Postpartum Depression is a serious public health issue, requiring further attention and a comprehensive health policy.	Literature Review	N/A	Research Articles	N/A	None	Most attributed cause of antenatal/postnatal depression is because of the absence of family support and husband can neutralize triggers. Childs perspective, PPD w/ negative impacts on cognition, emotional & physical dev of the infant and behavioral disturbances.	Public health awareness article of PPD and risks for child.
Stone, S. L., Diop, H., Declercq, E., Cabral, H. J., Fox, M. P., Wise, L. A.	2015	J Women's Health (Larchmt)	Stressful events during pregnancy and postpartum depressive symptoms	Understanding the relationship between perinatal stressors on the prevalence of PPD symptoms	Population based Cohort Study	Massachusetts	n=5,395 mothers who completed PRAMS and delivered babies from 2007-2010.	Selection bias could not be evaluated, only 69% weighted response over the 4 years. Vast majority of the questionnaires were completed by 4 mos, possibly misleading researchers to the actual number of PPD.	Massachusetts Pregnancy Risk Assessment Monitoring System (MA-PRAMS). Median response time was 3.2 months. 12 stressors placed into 4 groups, partner, traumatic, financial, and emotional.	Mothers who reported stressors were younger, unmarried, overweight or obese, smokers, and have lower education and family income, in comparison with those who reported no stressors. Partner related stressors had the strongest association related to PPD. 58% reported 1 or greater stressors, with reporting increasing prevalence of PPD. 38% of mothers sought help. Mothers with partner related stress were less likely to seek help, compared / mothers with other grouped stressors.	Data suggesting women during and after pregnancy should be screened for stressors, possibly increasing the risk of PPD. Providers may want to focus on partner related stressors as it held a strong association to PPD.
Toreki, A., Ando, B., Dudas, R., B., Dweik, D., Janka, Z., Kozinszky, Z., Kereszuri, A.	2014	Midwifery	Validation of the Edinburgh Postnatal Depression Scale as a screening tool for postpartum depression in a clinical sample in Hungary	To assess the validity of the EPDS in screening for PPD.	Cohort Study	Hungary	n=266 women, who were postpartum 6-8 weeks. Women were required to speak and write Hungarian.	The cultural differences of the sample, the timing, and the characteristics of the sample, impact the results. Clinical sample was used, further research to apply this EPDS to the hungarian community.	Women underwent at 6-8 weeks postnatal a SCID interview and completed the Hungarian EPDS screening tool. Cut off scores for this study was 7-8 for minor, and 12-13 for major depression.	Results of this study showed 8 (2%) were dx with major postnatal depression, 36 (13.5%) with minor depression, based on the SCID. Validation for the hungarian translation of the EPDS in the antenatal and postnatal periods, however performs better in postnatal period.	Good validity of using the EPDS in a Hungarian sample. Women now in Hungary can select a midwife for their pregnancy care and are given the EPDS 3 times during pregnancy, and once after birth.
Tsai, P., J., Nakashima, L., Yamamoto, J., Ngo, L., Kaneshiro, B.	2011	Hawaii Med J	Postpartum follow-up rates before and after the postpartum follow-up initiative at Queen Emma Clinic	To evaluate the postpartum follow-up rates as well as counseling opportunities for patients before and after the implementation of the Queen Emma Clinic postpartum f/u initiative.	Retrospective Cohort Study	Honolulu, Hawai'i	n= 221 women who received prenatal care at the Queen Emma Clinic. Pre- Intervention Group = 106. Post-Intervention Group = 115. Mean age was 26 years old.	This study took place in an urban clinic in Honolulu, generalization may be difficult.	Women were divided into 2 groups, those who delivered prior to the initiative and those who delivered after the initiative was implemented.	Women who had the initiative were more likely to show for their postpartum visits, 86.1% vs 71.7%. Women were more likely to come for 2 postpartum visits with the initiative 56.6% vs 39.6%.	Postpartum visit compliance is suboptimal, this simple, cost effective initiative was successful in bringing women to attend the postpartum visit. This initiative in the first phase placed the responsibility on the clinic staff vs the patient to schedule the 1st postpartum visit. The second phase included an incentive for mothers to come back for the 2nd visit.
Velders, F., P., Dieleman, G., Henrichs, J., Jaddoe, V., W., Hofman, A., Verhulst, F., C., Hudziak, J., J., Tiemeier, H.	2011	Eur Child Adolesc Psychiatry	Prenatal and postnatal psychological symptoms of parents and family functioning: the impact on child emotional and behavioural problems	To examine the effects of prenatal and postnatal depressive symptoms, prenatal and postnatal hostility with parents, and prenatal family functioning on the risk of child emotional and behavioral problems.	Population based cohort study	Netherlands	n=2,698 couples and children	Selection of sample occurred in higher SES classes. No observational data was collected, d/t feasibility. Sample population was very healthy, may need to limit generalizing.	Psychosocial sx were assess at 20 wks in pregnancy and when the child was 3 years old using the Brief Symptom Inventory (BSI). Family functioning was assessed using the General Functioning of the Family Assessment Device @ 20 wks in pregnancy. Child Behavior Checklist was utilized to obtain child's problem with behavior at age 3 years old.	Mothers with child w/ high internalizing problems were younger and less educated than mothers with low internalizing problems. These children with high internalizing problems were more likely firstborn, average a lower birth weight, and less often of western origin. Family functioning by mother and postnatal hostile behaviors contributed to the risks in 3 year old children.	Prevention and intervention strategies with a focus on psychological sx should be main focus, especially in families with young children.

Woolhouse, H., Gartland, D., Mensah, F., Giallo, R., Brown, S.	2015	Arch Women's Ment Health	Maternal depression from pregnancy to 4 years postpartum and emotional/behavioral difficulties in children: results from a prospective pregnancy cohort study	Evaluate the association between maternal depression and child emotional/behavioral difficulties at 4 years postpartum	Prospective pregnancy cohort study	Melbourne, Australia	n=1507, with mean gestation of 15.0 weeks, > 18 years old, and nulliparous.	Self-reported tool used vs. clinical interview. Child emotional/behavioral difficulties were learned from the mother reporting. EPDS cutoff score used was 13 and greater.	EPDS used with a cutoff score of 13 or greater to categorize depressive symptoms. Data collected at 1 mo, 3 mo, 6 mo, 12 mo, and 4 yrs. postpartum.	1 in 3 women with reports of depressive sx. (31.4%) during the study period. 1 in 5 reported depressive sx in pregnancy. Depression was noted to be Episodic vs. chronic. Risks included- since women, under 25 yrs. old, and not employed during the index pregnancy more likely to report depressive sx. Children w/ mothers who had depressive sx at 4 yrs. postpartum had 3-fold increase in odds of emotion/behavioral difficulties.	Postpartum depression more prominent at 4 years than any other point- need for screening in primary care.
Yonemoto, Naohiro, Dowswell, Therese, Nagai, Shuko, Mori, Rintaro	2013	Cochrane Database of Systematic Reviews	Schedules for home visits in the early postpartum period	Assess outcomes of different home-visiting schedules during the early post partum	Cochran Literature Review article Included studies that compared outcomes after home visits with outcomes with no visits or different types of home-visiting intervention studies	N/A	Eligible studies included participants in the early post partum period (up to 42 days).	Only 1-2 studies provided data for the specific outcomes.	Searched Cochrane Pregnancy and Childbirth Groups Trials Register (Jan 2013). Data from 12 randomized trials with data for more than 11,000 women	There was no strong evidence home visits were associated with maternal/neonatal mortality and improvements in maternal health. Findings were overall inconsistent.	Article about home visits and interventions, no correlation.
Zubaran, C., Schumacher, M., Roxo, M. R., Foresti, K.	2010	African Journal of Psychiatry	Screening tools for postpartum depression: validity and cultural dimensions	To evaluate the main postpartum screening tools currently being implemented based on their ability to screen for postnatal depression. Evaluated of culture characteristics of depressive postpartum symptoms.	Literature Review	N/A	Four screening tools evaluated: Edinburgh Postnatal Depression Scale (EPDS), Postpartum Depression Screening Scale (PDSS), Postpartum Depression Screening Scale Short Form (PDSS-SF), & Bromley Postnatal Depression Scale (BPDS)	Journal articles were from 1987-2009	Using Medline, with primary focus of publications from 1987-2009. Mesh Terms with focus on postpartum depression and postnatal depression, combined with assessment, screening and psychometric tools.	Regional variations, risk factors include local/environmental factors, including cultural and folklore element, religious practices, socioeconomic, lack of health care and poor public health. The EPDS most widely used screening tool. THE EPDS, PDSS, and PDDPI recommended, d't simple, low cost, & high sensitivity. All screening tools based on English language, complications with translation across the cultures. Need to develop valid tools within various cultures.	When EPDS used in 1st week postpartum, when 9/10 applied, has prognostic power to identify @ risk women who may dev. PPD @ 4-8 wks., limitation as it does not include women's exp. as a new mother.

Appendix B

SDP workflow process



Appendix C

Logic model

Program: Early postpartum depression screening program

Goal: Early detection of postpartum depression utilizing the Patient Health Questionnaire (PHQ-9) with early referral for treatment.

