Published in final edited form as:
Clin Obstet Gynecol. 2009 September ; 52(3): 456–468. doi:10.1097/GRF.0b013e3181b5a57c.

The Identification of Postpartum Depression

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Abstract

Postpartum depression (PPD) is the most common medical complication of childbearing. Universal screening maximizes the likelihood of prompt identification of PPD. Obstetrician-gynecologists routinely evaluate postpartum women for a general health examination and review of family planning options at approximately 6 weeks after birth; therefore, they are well-positioned to identify PPD. In this paper, we review the diagnostic criteria for postpartum depressive disorders and clinical risk factors predictive of PPD. We examine depression screening tools, appropriate cut-points associated with positive screens, the optimal timing for screening and the acceptability of depression screening in obstetrical settings. Lastly, we explore how to manage patients who screen positive for depression and treatment options for women with PPD.

Keywords

postpartum depression; identification; screening tools

INTRODUCTION

Postpartum depresssion (PPD) is the most common medical complication of childbearing. PPD occurs in 10 to 15% of new mothers (1). Groups of women at higher risk include inner city women (50–60%)(2), mothers of pre-term infants (3) and adolescents (4,5). Depression after delivery persists for more than 7 months in 25–50% of women (6,7). Lengthy post-birth depressive episodes may result in maternal social (8) or relational problems even after recovery (7,9–11). Moreover, PPD is associated with increased chronic medical disorders (12) and risk-related behaviors such as tobacco smoking (13) and alcohol abuse (14). Universal screening is an optimal approach to detection of new mothers who are suffering from depression following childbirth (15).

The substantial negative impact of PPD for mothers, infants, and their families has been established (16,17). Competent maternal function is critically important for ensuring the infant's safety and well being. Difficult temperament, poor self-regulation and behavioral problems have been observed in infants of depressed mothers (18). The depressed mother may not experience a positive and satisfying relationship with her infant, which serves to offset the stresses of newborn care and postpartum recovery (19). Maternal depression that disrupts the relationship between the mother and her infant contributes to a higher risk for poor infant and child developmental outcomes.

Obstetrician-gynecologists and midwives who evaluate postpartum women are a well-positioned, crucial resource for the prevention, detection and treatment PPD. Most mothers visit their obstetricians four to six weeks post-delivery for an examination and review of family

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planning options. Several national and state-based agencies, such as the US Preventive Health Task Force, 2002 (20), American College of Obstetricians and Gynecologists-ACOG, April 2008 (21), State of New Jersey http://www.njleg.state.nj.us/2006/Bills/PL06/12.HTM, and the Michigan Quality Improvement Consortium (22) strongly advocate for routine screening to improve the identification of depressed perinatal patients (20).

In this paper, we review the diagnostic criteria for postpartum depressive disorders, the differential diagnosis and clinical risk factors that are predictive of PPD. We examine depression screening tools, appropriate cut-points for positive screens, the optimal timing of screening and the acceptability of depression screening in OB settings. Lastly, we explore how to manage patients with positive screens, suicidality and PPD.

DIAGNOSIS and CLINICAL RISK FACTORS of PPD

Diagnosis

In the Diagnostic and Statistical Manual (DSM-IV)(23), an episode of major depression after delivery is defined as two weeks or more of persistent: 1) depressed mood, or 2) loss of interest in daily activities plus four associated symptoms (appetite disturbance, sleep disturbance, psychomotor agitation or slowing, fatigue, feelings of worthlessness or inappropriate guilt, poor concentration, suicidal ideation) that onset within 4 weeks after childbirth. PPD contrasts with the transient symptoms of the “baby blues” - brief crying spells, irritability, nervousness, poor sleep and emotional reactivity. The baby blues affect 75% of new mothers, onset within 1–2 days and resolve by 10 days post-delivery. Although presentations vary, mothers with major depression typically describe a diminished pleasure in interacting with people or formerly enjoyable activities as well as feelings of low self-efficacy (24) rather than having depressed mood. Severe symptoms may include difficulty making simple decisions, anxiety, agitation, poor self-care, intense hopelessness and suicidal ideation or plan. One example is a tired mother who has a terrible appetite; lost 40 pounds after delivery; feels she is a bad mother; cannot fall asleep even when the baby sleeps soundly; and worries incessantly about harm befalling her family.

Differential Diagnosis

Mothers with rapid onset of intense mood disturbance, confusion, strange or delusional beliefs, hallucinations and disorganized behaviors have symptoms of postpartum psychosis, which is most commonly form of Bipolar Disorder (BD) (25). Within the first month of childbirth, women who have BD are at the high risk for episode emergence than at any other point in the life cycle (26)(RR=21.7)(27). BD is characterized by recurrent episodes of major depression that alternate with episodes of mania or hypomania. Clinicians can recognize mania or hypomania in patients with an elated, expansive or irritable mood, inflated self-esteem, excessive activity or planning and distracted concentration. The episodes of mania often result in poor judgment, impaired performance or disrupted relationships; whereas hypomanic episodes may result in heightened creativity and productivity without impairment (28). A helpful clinical tool to distinguish bipolar disorder from unipolar depression is the WHIPLASHED mnemonic – see http://www.psychiatrictimes.com/display/article/10168/55321; Ronald Pies, M.D. Bipolar depression is suspected in the new mother who describes feeling wired or worse on antidepressant therapy; hypomania (periods of elation or heightened energy); irritability or hostility; psychomotor agitation or slowing; loaded family history (for bipolar disorder, depression, alcohol use disorders), abrupt onset or resolution of depressive episodes, seasonal patterns of depression; hypersomnia or hyperphagia; early age of first depressive illness; and delusional beliefs (hallucinations or other psychotic symptoms).

Other illnesses that cause postpartum distress include anxiety disorders e.g. panic disorder or obsessive compulsive disorder (OCD), schizophrenia and medical conditions such as hyperthyroidism or hypothyroidism, which are addressed in excellent references (29–32). The first post-natal months are a period of high risk for the onset of anxiety disorders (29,33). New mothers with panic attacks have discrete, intense episodes of fear or discomfort that last 5–15 minutes along with symptoms of palpitations, sweating, shortness of breath, choking, nausea, abdominal discomfort, dizziness, unsteadiness, numbness or tingling, chills, hot flashes, or a fear of dying or losing control. The patients with panic disorder describe recurrent panic attacks that are associated with a dread of future attacks; in severe cases, patients restrict their outside activities due to fear of having a panic attack where help is unavailable (agoraphobia). One patient reported that she only drives 1–2 miles to grocery-shop for her husband and children, avoids bridges or tunnels which trigger panic attacks and feels intense anxiety when she is not accompanied by a trusted family member.

OCD is characterized by intrusive thoughts and compulsive behaviors performed to relieve the distress that stems from the intrusive thoughts. Symptoms last for more than one hour daily and cause impaired function. The postpartum parent with OCD might check her healthy, full-term baby every ten minutes throughout the night to make sure that the infant continues to breathe, or count to 30 every time she diapers the baby to prevent some harm from occurring. Other common intrusive thoughts center on a range of themes: contamination, causing harm, offensive images, religious preoccupations and urges for symmetry or order. Compulsions include cleaning or washing, checking, repeating, rearranging, hoarding, and mental rituals like counting and praying.

New mothers with solely panic disorder or OCD do not describe a low or depressed mood and are still able to enjoy their usual activities. However, women with depression during the postpartum period may present with concurrent panic disorder or OCD. Patients with OCD are distressed by their unwanted disturbing cognitions (ego-dystonic). This characteristic distinguishes OCD patients from the patients with schizophrenia who have fixed unusual or bizarre beliefs (delusional thoughts), hallucinations, disorganized thoughts or behaviors and poor insight into their symptoms or illness. Since the symptoms of hyperthyroidism overlap with anxiety and panic symptoms, women with the onset anxiety disorders after delivery require thyroid function tests.

Predictors of PPD

Exploring the predictors of PPD during antepartum or early postnatal visits can uncover maternal liability for depression (34–36). Predictors include previous episodes of major depression, family history of depression (37) and depression during pregnancy (38). Other important demographic and clinical data predictive of PPD are recent immigrant status (39), increased stressful life events(40), history of childhood sexual abuse (36) and decision to stop antidepressant therapy during pregnancy (41).

DEPRESSION SCREENING

“You can’t tell by looking” was the theme of The Perinatal Foundation’s Public Awareness Campaign for Perinatal Mood Disorders (www.perinatalweb.org) to counter the myth that depression can be diagnosed without a clinical examination. Universal depression screening in outpatient settings improves detection rates compared to routine care (35.4% and 6.3%, respectively; P=0.001) (42). Psychometric properties that define an excellent screening tool are: sensitivity (the proportion of women with major depression who were true positives), specificity (the proportion of non-depressed women who were true negatives) and the positive predictive value (the probability that women with positive screens actually have a depressive disorder).

Edinburgh Postnatal Depression Scale (EPDS)

The most common measure to screen for depression related to childbearing is the EPDS. This self-report instrument contains ten items ranked from 0 to 3 that reflect the patient's experience over the past week. The EPDS has been validated extensively for use in the postpartum period (43–45) and during pregnancy (21,46,47).

What is an appropriate cut-point?

An EPDS ≥13 is an acceptable cut-point for identifying women at risk for major depression in clinical settings (43). With an EPDS score ≥13, 86% of postpartum women were diagnosed with major or minor depression (sensitivity) by the Research Diagnostic interview (specificity=78%, positive predictive=73%)(38). Screening of a community sample of women 4–6weeks post-delivery (n=400) identified 6% of screened patients with PPD confirmed by the SCID (48). Also, an EPDS ≥13 corresponds with a Hamilton Rating Scale for Depression (HRSD) ≥20 (49) which suggests a high probability for a major depressive episode (50). For clinicians who wish to implement antenatal screening, the recommended cut-point is an EPDS≥15 (47)(47,51,52). The higher threshold is clinically justified since increased scores may be explained by transient stress unrelated to a depressive disorder, but related to normative experiences of pregnancy (35).

When to screen?

The optimal time to screen for PPD is at the first postnatal obstetrical visit, since extensive data suggest the onset of postpartum disorders occur within the first month of childbirth (26). Patients who report the onset of symptoms within days of delivery (36,53) can be assessed by telephone with the EPDS. The new mother who scores above the EPDS≥13 cut-point should be scheduled for an earlier post-natal visit to review her mood symptoms and physical state.

Partner ratings

An important component of PPD may be the relational disorder in the marriage across domains of lack of support, loss of emotional closeness and sexual dissatisfaction (54,55). For postpartum mothers who are accompanied by supportive spouses, obtaining partner ratings of symptom levels is another strategy to assess maternal depression (that reduces self-report bias). The EPDS and EPDS-Partner (P) ratings (55) could be used in treatment sessions to probe each partner's experience of the mother's depression. Of 101 couples who recently became parents, investigators quantified symptom levels with the EPDS, EPDS-P, Beck Depression Inventory (BDI) and HRSD (55). Their findings suggested very acceptable psychometric properties of the EPDS-P. The internal consistency measurements on the Cronbach's coefficient were alpha=0.80 for EPDS-P (n=93) and alpha=0.85 for EPDS (n=90); retest scores were stable at 2 and 6 weeks; the EPDS-P at 2 weeks was significantly correlated with the HRSD at 6 weeks (55). Therefore, the EPDS-P is another reliable measure of maternal depression after childbirth and is predictive of maternal depression levels beyond the contribution of the EPDS.

Other Screening Instruments

The *Center for Epidemiologic Studies of Depression instrument* (CES-D) is a 20-item questionnaire; scores ≥16 indicate depression based on symptoms in the last 7 days. CES-D scores remain stable in the first year postpartum and are associated with the diagnostic status of depressive disorders (56,57). The CES-D has been used extensively to screen for depression in culturally diverse populations (56) and adolescent mothers (high sensitivity and specificity) (58).

The 9-item depression module of the *Patient Health Questionnaire* (PHQ-9)(59) is another common screening measure. Responses at 4 levels (not at all, several days, more than half the

days and nearly every day) apply to how the patient has felt in the past 2 weeks. The full PHQ and the PHQ-9 (brief version) effectively identified patients with and without major depression in primary care and obstetrical settings (59). The high sensitivity (88%) and specificity (88%) assure the validity of the PHQ for identifying depression risk (59,60). However, further validation data are needed for the evaluation of postpartum patients (61).

The *Postpartum Depression Screening Scale* (PDSS)(62,63) evolved from qualitative interviews to explore the maternal experience after childbirth. Seven items comprise the initial screening; patients with PDSS≥14 received an extensive survey of 28 additional items. Scores ≥60 suggest risk for major or minor depression; scores ≥80 are highly predictive of major depression (62). The PDSS has been used effectively for telephone screening (64) and the screening of women in Spanish speaking and American Native communities (65,66). Problems with the cost per use (copyright) and high rates of false positive screens could restrict the utility of this tool (61).

In a comprehensive review, Boyd et al,(67) identified additional instruments with good psychometric properties to assess perinatal symptoms. These instruments included the General Health Questionnaire (GHQ – used in general medical settings to assess psychiatric symptoms in 4 subcategories of depression, anxiety/sleep, somatic symptoms and social functioning) (68), Beck Depression Inventory (BDI I or II)(69) and the Inventory of Depressive Symptomatology (IDS – 28-item self report OR 30-item clinician rated inventory)(70,71). These instruments all had sufficient data that demonstrated validity among women who speak different languages (67)(72). The EPDS and BDI correlated highly with anxiety measures; high scores on either instrument could suggest risk for anxiety disorders also. To identify additional psychiatric comorbidities, the GHQ may be a more helpful instrument (72). The IDS is useful for assessments of inner city or other ethnic populations of women (69).

Is depression screening acceptable?

Acceptability is an important indicator of how likely patients will answer the questionnaire that informs about their risk for depression and how likely clinicians will administer the instrument. Researchers found similarly high rates of acceptability and willingness to complete the EPDS among women who accompanied their children to pediatric visits (85%)(73) and groups of English and non-English speaking mothers (90%)(74). Survey responders likely self-select; therefore, the estimates of acceptability may be over-represented. No discomfort was reported by 87% of women at low risk (EPDS<13) compared to only 64% of women with high risk (EPDS≥13)(chi square=31.9 df=2 $p<0.0001$). Therefore, perception of discomfort with screening is most closely related to depression risk.

In a study of the acceptability of antenatal and postnatal screening, patients and professionals reported that the EPDS was “easy or fairly easy” to complete among 93.4% (n=860) of patients, 83% nurses (n=230), 76% (n=194) of midwives and only 71% (n=118) of GPs (75). Despite evidence of the benefits of screening, only 54% of general practitioners incorporated routine screening into their practice, compared to 89% or nurses and 68% of midwives (75). Changing practice patterns may be difficult (73). Physicians often prefer the direct interviewing style, may not recognize the efficiency of the screening tools and feel less need from further training (75). Provider education may be necessary to improve awareness of the benefits and efficiency of the screening tools.

Screening Recommendations

In ambulatory clinics, the EPDS is an appropriate self-report tool for depression screening. The recommended cut-point to detect PPD is an EPDS≥13. The optimal time to screen is 4–6 weeks after delivery. For mothers with supportive partners, the EPDS-P is a helpful adjunctive

tool for assessing maternal depression. The CES-D is an acceptable instrument to use with new adolescent mothers. In OB and primary care settings, the PHQ or GHQ are efficient tools for identifying PPD and comorbid disorders. When screening is conducted for Spanish speaking women, the PDSS may be a useful (albeit costly) instrument; for women belonging to ethnic or minority communities, the IDS is an effective screening tool.

MANAGEMENT OF WOMEN WITH HIGH DEPRESSION SCORES

Patients with EPDS≥13 are at substantial risk for major depression and require prompt depression care and treatment planning. Psychiatric treatment referral is indicated for patients who have high depression levels, comorbid disorders or inadequate treatment response. Women with severe symptoms, such as a score of 1 or more on item 10 (thoughts of self harm), homicidal ideation, bizarre thoughts or disorganized behaviors, require referral to emergency mental health services. Another ingredient to successful treatment is the availability of a depression care manager. The care manager can be a clinic-based professional (nurse or experienced clinician) who provides education and telephone support to patients, coordinates care and identifies resources that help to circumvent treatment barriers e.g. transportation, insurance coverage, prescription fees. These depression care activities may be critical to improved treatment outcomes.

Depression Care Model in the OB Setting

To understand the feasibility of depression screening in OB clinics (76), investigators conducted a study of 233/293 (79.5%) university clinic patients and 593/708 (82.3%) private patients who agreed to participate. The researchers identified depression risk (PHQ-9 score ≥10) in 40/47 (85%) and 26/48 (54%) of the participants respectively. Participants with depression risk received an intervention that involved meeting a social worker (SW) who provided depression education, arranged referrals and completed a 1-month follow-up call (reached >90%). At the follow-up call, the SW explored the participants' action taken to obtain depression care, satisfaction levels and barriers to care. Compared to private patients, university clinic patients preferred to receive depression care with their OB/GYN rather than other providers. The patients, physicians and office staff in both settings felt highly satisfied with the SW's intervention. Follow through with referrals arranged by the SW was encouraging; 78% of the university clinic patients who received mental health referrals via the SW kept their appointments. In contrast, fewer than half of patients followed through with referrals made by the usual staff. The findings also highlighted critical information about barriers to care. Common treatment barriers were concerns about others' perceptions; and lack of efficient transfer to psychiatric services (e.g. 17–25% of women had to contact their insurance company independently to identify a participating provider). Many women (70% of private and 60% of university based clinics) reported that they used internal resources or other sources for help with managing depression rather than pursue professional treatment (74). This pilot model suggests that routine screening and provision of a care manager are feasible and may improve depression outcomes for OB patients in different settings.

Other Innovative Models of Depression Care

Investigators are exploring innovative solutions such as web-based depression screening and home visitor programs to optimize the management of women at risk for PPD. In one investigation, postpartum women were identified with depression risk (EPDS>9) from a web-based program (n=701 out of 21,470 women)(77). Women assigned to receive support from trained peer volunteers had a significantly lower risk for depression (EPDS>12)(14% - 40/297) compared to women assigned to standard care (25%-78/315)(chi-square=12.5 p<0.001 NNT=8 95%CI=5.9–19.6). In another investigation (78), the depression risk (EPDS≥12) of patients randomized to in-home psychotherapy skills training (cognitive behavioral or person-centered)

(12.4% 234/1880) was significantly lower than the risk of patients assigned to usual care (16.7% 166/995)(odds ratio 0.67 95%CI=0.51–0.87 p=0.003)(78). These studies demonstrated that innovative programs that expand the maternal support network may improve maternal mood outcomes. The cost and cost-effectiveness of these programs still needs to be calculated.

TREATMENT OPTIONS FOR PPD

Once PPD is identified, rapidly implemented treatment is essential. Without prompt treatment, patients are at risk for lengthy illness that could lead to impaired functioning, worsening symptoms, treatment resistance and suicide. Similar to the management of major depressive disorder outside of childbearing, the evidence-based mainstays of PPD treatment are focused psychotherapy and/or antidepressant medication (79). In an elegant randomized control trial, O'Hara et al. (80) found that interpersonal psychotherapy more effectively reduced depressive symptoms than a wait-list control condition. For depressed adolescents, a combination of fluoxetine and cognitive behavioral therapy was effective (www.nimh.nih.gov/healthinformation/tads.cfm).

Antidepressants are efficacious for the treatment of PPD. Appleby et al. (81) found that fluoxetine (20 mg/day) was significantly more effective than placebo. Sertraline prescribed at 50–200 mg/day induced remission (HRSD ≤7) in 14/21 (66%) of patients who completed an 8 week trial (82). Cohen et al. (83) found that venlafaxine (75–225 mg/day) resulted in an 80% remission rate. In the only randomized comparative trial of antidepressants for women with PPD, patients responded equivalently to treatment with the tricyclic agent nortriptyline and the serotonin reuptake inhibitor sertraline (84). The majority of patients required dosing of sertraline >100mg daily or nortriptyline ≥75mg daily for full response (84). Antidepressant transmission through breast milk is a consideration in PPD treatment. Low or undetectable levels of the majority of antidepressants have been found in infant sera, and no developmental problems have been described (85)(and see this issue, Lanza di Scalia, 2009). Treatment choice is best informed by the patient's response to past treatment trials. Recommendations for the clinical care of postpartum disorders and a decision-making model to assess risks and benefits of antidepressant treatments are available (79)(85)(86)(87)(88).

Increasing the range of treatment options may improve the likelihood the patient will accept treatment and reinforce her central role in choosing a treatment plan. Investigation of novel therapies for childbearing women include bright light treatment, which is efficacious for both seasonal and non-seasonal depression (89–91); nutritional intervention (92,93); essential fatty acid supplements (94,95); regular aerobic exercise (96,97); and transdermal estradiol therapy (see this issue - Moses-Kolko, 2009). Although the evidence base is not as extensive as for psychotherapy and antidepressants, the availability of high-quality studies on promising new therapies provides hope for women who decline standard treatments. Provision of novel therapies allows establishment of a relationship which may pave the way for sequential treatments if the chosen therapy does not result in achievement of the patients' goals.

CONCLUSION

Routine depression screening in OB settings is an efficient and feasible method to improve the identification of postpartum depressed patients with minimal risk for harm. The majority of risk factors for the development of PPD are present during the antenatal period, underscoring the importance of the medical history in the identification of high risk populations.

The EPDS is an acceptable instrument for routine screening. The recommended cut-point is an EPDS≥13; the optimal time to screen for depression is 4–6 weeks after delivery. Patients who score above this cut-point require prompt treatment planning and possible referral for mental health care. The patient with suicidal ideation, thoughts to harm others or disorganized

behaviors requires emergency psychiatric services. Availability of a depression care manager, who provides education, telephone support and coordinates referrals, is feasible and may improve depression outcomes. Although the evidence-based mainstays of treatment are focused psychotherapy and/or antidepressant medication, an increased range of treatments may improve acceptability and bolster the patient's role in planning her treatment.

ACKNOWLEDGMENTS

Dr. Sit's contributions were supported by National Institute of Mental Health for the grants R01 MH60335 (PI: K.L. Wisner) and K23 MH082114-01A2 (PI: D. Sit), and the International Society of Bipolar Disorders Fellowship Award (PI: D. Sit). Dr. Wisner's contributions were supported primarily by the National Institute of Mental Health for the following grants: R01 MH60335, R01 MH071825 and R01 MH075921 (PI: K.L. Wisner). Dr. Wisner has also received grant support from the Society for Bariatric Surgery, the Heinz Foundation, the New York—Mid-Atlantic Consortium for Genetics and Newborn Screening Services, Novogyne, Pfizer, the Stanley Medical Research Foundation, and the State of Pennsylvania.

REFERENCES

1. Gaynes BNGN, Meltzer-Brody S, Lohr KN, Swinson T, Gartlehner G, Brody S, Miller WC. Perinatal depression: prevalence, screening accuracy, and screening outcomes. Summary, Evidence Report/ Technology Assessment No. 119. 2005AHRQ Publication No. 05-E006-1
2. Hobfoll SE, Ritter C, Lavin J, Hulsizer MR, Cameron RP. Depression prevalence and incidence among inner-city pregnant and postpartum women. Journal of Consulting & Clinical Psychology 1995;63(3): 445–453. [PubMed: 7608357]
3. Logsdon MC, Davis DW, Birkimer JC, Wilkerson S. Predictors of depression in mothers of pre-term infants. Journal of Social Behavior and Personality 1997;12:73–88.
4. Troutman B, Cutrona C. Nonpsychotic postpartum depression among adolescents. Journal of Abnormal Psychology 1990;99:69–78. [PubMed: 2307769]
5. Logsdon MC, Birkimer JC, Simpson T, Looney S. Postpartum depression and social support in adolescents. JOGNN - Journal of Obstetric, Gynecologic, & Neonatal Nursing 2005;34(1):46–54.
6. O'Hara MW. Post-partum "blues," depression, and psychosis: A review. Journal of Psychosomatic Obstetrics and Gynaecology 1987;73:205–227.
7. England R. Infant development and management of infant problems in a family setting. Australian Family Physician 1994;23(10):1877–1882. [PubMed: 7818385]
8. Segre LS, O'Hara MW, Arndt S, Stuart S. The prevalence of postpartum depression: the relative significance of three social status indices. Social Psychiatry & Psychiatric Epidemiology 2007;42(4): 316–321. [PubMed: 17370048]
9. Kendler KS, Neale MC, Kessler RC, Heath AC, Eaves LJ. The lifetime history of major depression in women. Reliability of diagnosis and heritability. Archives of General Psychiatry 1993;50(11):863–870. [PubMed: 8215812]
10. Forman DR, O'Hara MW, Stuart S, Gorman LL, Larsen KE, Coy KC. Effective treatment for postpartum depression is not sufficient to improve the developing mother-child relationship. Development & Psychopathology 2007;19(2):585–602. [PubMed: 17459185]
11. Gunlicks ML, Weissman MM. Change in child psychopathology with improvement in parental depression: a systematic review. Journal of the American Academy of Child & Adolescent Psychiatry 2008;47(4):379–389. [PubMed: 18388766]
12. Miranda J, Chung JY, Green BL, Krupnick J, Siddique J, Revicki DA, et al. Treating depression in predominantly low-income young minority women: a randomized controlled trial. JAMA 2003;290 (1):57–65. [PubMed: 12837712][see comment]
13. McCoy SJ, Beal JM, Saunders B, Hill EN, Payton ME, Watson GH. Risk factors for postpartum depression: a retrospective investigation. Journal of Reproductive Medicine 2008;53(3):166–170. [PubMed: 18441719]
14. Homish GG, Cornelius JR, Richardson GA, Day NL. Antenatal risk factors associated with postpartum comorbid alcohol use and depressive symptomatology. Alcoholism: Clinical & Experimental Research 2004;28(8):1242–1248.

15. Wisner KL, Chambers C, Sit DK. Postpartum depression: a major public health problem. JAMA 2006;296(21):2616–2618. [PubMed: 17148727][comment]
16. Bonari L, Pinto N, Ahn C, Einarson A, Steiner M, Koren G. Perinatal risks of untreated depression duirng pregnancy. Can J Psychiatry 2004;49:726–735. [PubMed: 15633850]
17. Goodman SH, Gotlib IH. Risk for psychopathology in the children of depressed mothers: a developmental model for understanding mechanisms of transmission. Psychological Review 1999;106(3):458–490. [PubMed: 10467895]
18. Murray L. The impact of postnatal depression on infant development. Journal of Child Psychology and Psychiatry 1992;35:343–361.
19. Horowitz JA, Damato EG. Mother's perceptions of postpartum stress and satisfaction. Journal of Obstetric, Gynecologic, & Neonatal Nursing 1999;28:595–605.
20. (USPSTF) USPSTF. Screening for Depression: Recommendations and Rationale [Miscellaneous Article]. Annals of Internal Medicine 2002;136(10):760–764. [PubMed: 12020145]
21. ACOG. ACOG Practice Bulletin: clinical management guidelines for obstetrician-gynecologists number 92, April 2008. Use of psychiatric medications during pregnancy and lactation. Obstet Gynecol 2008;111:1001–1020. [PubMed: 18378767]
22. Michigan Quality Improvement Consortium: routine prenatal and postnatal care. Southfield, MI: 2006 Jul.
23. American Psychiatric Association. Diagnostic and Statistical Manual for Psychiatric Disorders. Vol. 4th Edition. Washington, DC: American Psychatric Association; 2000. Text Revision
24. Teti DM, Gelfand DM. Behavioral competence among mothers of infants in the first year: the mediational role of maternal self-efficacy. Child Development 1991;62(5):918–929. [PubMed: 1756667]
25. Sit D, Rothschild AJ, Wisner KL. A review of postpartum psychosis. Journal of Women's Health 2006;15(4):352–368.
26. Munk-Olsen T, Laursen TM, Pedersen CB, Mors O, Mortensen PB. New parents and mental disorders: a population-based register study. JAMA 2006;296(21):2582–2589. [PubMed: 17148723][see comment]
27. Kendell R, Chalmers J, Platz C. Epidemiology of puerperal psychoses. British Journal of Psychiatry 1987;150:662–673. [PubMed: 3651704]
28. Yonkers K, Wisner K, Stowe Z, Leibenluft E, Cohen L, Miller L, et al. Management of bipolar disorder during pregnancy and the postpartum period. Am J Psych 2004;161:608–620.
29. Wisner K, Peindl K, Gigliotti T, Hanusa B. Obsessions and compulsions in women with postpartum depression. Journal of Clinical Psychiatry 1999;60:176–180. [PubMed: 10192593]
30. Brouwers EPM, Van Baar AL, Pop VJM. Maternal anxiety during pregnancy and subsequent infant development. Infant Behavior & Development 2001;24:95–106.
31. Seeman MV. Gender differences in the prescribing of antipsychotic drugs. American Journal of Psychiatry 2004;161(8):1324–1333. [PubMed: 15285956]
32. Wisner K, Stowe Z. Psychobiology of postpartum mood disorders. Seminars in Reproductive Endocrinology 1997;15:77–89. [PubMed: 9065980]
33. Wisner K, Peindl K, Hanusa B. Effects of childbearing on the natural history of panic disorder with comorbid mood disorder. Journal of Affective Disorders 1996;41:173–180. [PubMed: 8988449]
34. Blackmore ER, Carroll J, Reid A, Biringer A, Glazier RH, Midmer D, et al. The use of the Antenatal Psychosocial Health Assessment (ALPHA) tool in the detection of psychosocial risk factors for postpartum depression: a randomized controlled trial. Journal of Obstetrics & Gynaecology Canada: JOGC 2006;28(10):873–878.
35. Milgrom J, Gemmill AW, Bilszta JL, Hayes B, Barnett B, Brooks J, et al. Antenatal risk factors for postnatal depression: a large prospective study. Journal of Affective Disorders 2008;108(1–2):147–157. [PubMed: 18067974]
36. Dennis CL, Ross LE. Depressive symptomatology in the immediate postnatal period: identifying maternal characteristics related to true- and false-positive screening scores. Canadian Journal of Psychiatry - Revue Canadienne de Psychiatrie 2006;51(5):265–273. [PubMed: 16986815]

37. O'Hara M, Neunaber D, Zekoski E. Prospective study of postpartum depression: Prevalence, course, and predictive factors. Journal of Abnormal Psychology 1984;93:158–171. [PubMed: 6725749]
38. O'Hara MW, Swain AM. Rates and risks of postpartum depression - a meta-analysis. International Review of Psychiatry 1996;8(1):37–54.
39. Dennis CL, Janssen PA, Singer J. Identifying women at-risk for postpartum depression in the immediate postpartum period. Acta Psychiatrica Scandinavica 2004;110(5):338–346. [PubMed: 15458557]
40. Mazure CM, Bruce ML, Maciejewski PK, Jacobs SC. Adverse life events and cognitive-personality characteristics in the prediction of major depression and antidepressant response. American Journal of Psychiatry 2000;157(6):896–903. [PubMed: 10831468]
41. Cohen LS, Altshuler LL, Harlow BL, Nonacs R, Newport DJ, Viguera AC, et al. Relapse of major depression during pregnancy in women who maintain or discontinue antidepressant treatment.[see comment][erratum appears in JAMA. 2006 Jul 12;296(2):170]. JAMA 2006;295(5):499–507. [PubMed: 16449615]
42. Evins GG, Theofrastous JP, Galvin SL. Postpartum depression: a comparison of screening and routine clinical evaluation. American Journal of Obstetrics & Gynecology 2000;182(5):1080–1082. [PubMed: 10819833]
43. Cox J, Holden J, Sagovsky R. Detection of postnatal depression: Development of the 10-item Edinburgh Postnatal Depression Scale. British Journal of Psychiatry 1987;150:782–786. [PubMed: 3651732]
44. Harris B, Huckle P, Thomas R, Johns S, Fung H. The use of rating scales to identify post-natal depression. British Journal of Psychiatry 1989;154:813–817. [PubMed: 2597888]
45. Murray L, Carothers AD. The validation of the Edinburgh Postnatal Depression Scale on a community sample. Br J Psychiatry 1990;157:288–290. [PubMed: 2224383]
46. Felice E, Saliba J, Grech V, Cox J, Calleja N. Antenatal psychiatric morbidity in Maltese women. General Hospital Psychiatry 2007;29(6):501–505. [PubMed: 18022043]
47. Adouard F, Glangeaud-Freudenthal NM, Golse B. Validation of the Edinburgh postnatal depression scale (EPDS) in a sample of women with high-risk pregnancies in France. Archives of Women's Mental Health 2005;8(2):89–95.
48. Wisner, KL. SYMPOSIUM: CLINICAL ISSUES IN PERINATAL MENTAL HEALTH CARE: Initial Results from an NIMH-funded Study of Screening for Postpartum Depression; International Marce Society Biannnual Meeting; Sydney, Australia. 2008 Sep.
49. Peindl K, Wisner K, Hanusa B. Identifying depression in the first postpartum year: Guidelines for office-based screening and referral. Journal of Affective Disorders 2004;80(1):37–44. [PubMed: 15094256]
50. Frank E, Kupfer D, Perel J. Three-year outcomes for maintenance therapies in recurrent depression. Archives of General Psychiatry 1990;47:1093–1099. [PubMed: 2244793]
51. Johanson R, Chapman G, Murray D, Johnson I, Cox J. The North Staffordshire Maternity Hospital prospective study of pregnancy-associated depression. Journal of Psychosomatic Obstetrics & Gynecology 2000;21(2):93–97. [PubMed: 10994181]
52. Felice E, Saliba J, Grech V, Cox J. Validation of the Maltese version of the Edinburgh Postnatal Depression Scale. Archives of Women's Mental Health 2006;9(2):75–80.
53. Hannah P, Adams D, Lee A, Glover V, Sandler M. Links between early post-partum mood and post-natal depression. British Journal of Psychiatry 1992;160:777–780. [PubMed: 1617360][see comment]
54. Gotlib, IH.; Hooley, JM. Depression and marital distress: current status and future directions. Duck, S., editor.
55. Moran TE, O'Hara MW. A partner-rating scale of postpartum depression: the Edinburgh Postnatal Depression Scale - Partner (EPDS-P). Archives of Women's Mental Health 2006;9(4):173–180.
56. Beeghly M, Olson KL, Weinberg MK, Pierre SC, Downey N, Tronick EZ. Prevalence, stability, and socio-demographic correlates of depressive symptoms in Black mothers during the first 18 months postpartum. Maternal & Child Health Journal 2003;7(3):157–168. [PubMed: 14509411]

57. Beeghly M, Weinberg MK, Olson KL, Kernan H, Riley J, Tronick EZ. Stability and change in level of maternal depressive symptomatology during the first postpartum year. Journal of Affective Disorders 2002;71(1–3):169–180. [PubMed: 12167513]
58. Roberts R, Andrews JA, Lewinsohn PM, Hops H. Assessment of depression in adolescents using the Center for Epidemiologic Studies depression scale. Psychological Assessment 1990;2:122–128.
59. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. Journal of General Internal Medicine 2001;16(9):606–613. [PubMed: 11556941]
60. Spitzer RL, Kroenke K, Williams JB, et al. Validation and utility of a self-report version of PRIME-MD: The PHQ Primary Care Study. The Journal of the American Medical Association 1999;282:1737–1744.
61. Hanusa BH, Scholle SH, Haskett RF, Spadaro K, Wisner KL. Screening for depression in the postpartum period: a comparison of three instruments. Journal of Women's Health 2008;17(4):585–596.
62. Beck CT, Gable RK. Comparative analysis of the performance of the Postpartum Depression Screening Scale with two other depression instruments. Nursing Research 2001;50(4):242–250. [PubMed: 11480533]
63. Beck CT, Gable RK. Postpartum Depression Screening Scale: development and psychometric testing. Nursing Research 2000;49(5):272–282. [PubMed: 11009122]
64. Mitchell AM, Mittelstaedt ME, Schott-Baer D. Postpartum depression: the reliability of telephone screening. MCN, American Journal of Maternal Child Nursing 2006;31(6):382–387.
65. Beck CT, Froman RD, Bernal H. Acculturation level and postpartum depression in Hispanic mothers. MCN, American Journal of Maternal Child Nursing 2005;30(5):299–304.
66. Baker L, Cross S, Greaver L, Wei G, Lewis R. Healthy Start C. Prevalence of postpartum depression in a native American population. Maternal & Child Health Journal 2005;9(1):21–25. [PubMed: 15880971][see comment]
67. Boyd RC, Le HN, Somberg R. Review of screening instruments for postpartum depression. Archives of Women's Mental Health 2005;8(3):141–153.
68. Goldberg, DP. The detection of psychiatric illness by questionnaire. Vol. Vol. 21. Oxford: Oxford University Press; 1972.
69. Beck, AT.; Steer, RA.; Brown, GK. Manual for Beck Depression Inventory-II. San Antonio: Psychological Corporation; 1996.
70. Rush AJ, Gullion CM, Basco MR, Jarrett RB, Trivedi MH. The inventory of depressive symptomatology (IDS): psychometric properties. Psychol Med 1996;26:477–486. [PubMed: 8733206]
71. Yonkers K, Ramin SM, Rush AJ, Navarrete CA, Carmod T, March D, et al. Onset and persistence of postpartum depression in an inner-city maternal health clinic system. Am J Psychiatry 2001;158:1856–1863. [PubMed: 11691692]
72. Lee DT, Yip AS, Chiu HF, Leung TY, Chung TK. Screening for postnatal depression: are specific instruments mandatory? Journal of Affective Disorders 2001;63(1–3):233–238. [PubMed: 11246101]
73. Chaudron LH, Szilagyi PG, Kitzman HJ, Wadkins HI, Conwell Y. Detection of postpartum depressive symptoms by screening at well-child visits. Pediatrics 2004;113(3 Pt 1):551–558. [PubMed: 14993549]
74. Matthey S, White T, Phillips J, Taouk R, Chee TT, Barnett B. Acceptability of routine antenatal psychosocial assessments to women from English and non-English speaking backgrounds. Archives of Women's Mental Health 2005;8(3):171–180.
75. Buist A, Condon J, Brooks J, Speelman C, Milgrom J, Hayes B, et al. Acceptability of routine screening for perinatal depression. Journal of Affective Disorders 2006;93(1–3):233–237. [PubMed: 16647761]
76. Scholle SH, Kelleher KJ. Assessing primary care among young, low-income women. Women and Health 2003;37(1):15–30.
77. Dennis CL, Hodnett E, Kenton L, Weston J, Zupancic J, Stewart DE, et al. Effect of peer support on prevention of postnatal depression among high risk women: multisite randomised controlled trial. BMJ 2009;338:a3064. [PubMed: 19147637][see comment]

78. Morrell CJ, Slade P, Warner R, Paley G, Dixon S, Walters SJ, et al. Clinical effectiveness of health visitor training in psychologically informed approaches for depression in postnatal women: pragmatic cluster randomised trial in primary care. BMJ 2009;338:a3045. [PubMed: 19147636][see comment]
79. Wisner K, Parry B, Piontek C. Clinical Practice: Postpartum depression. New England Journal of Medicine 2002;347:194–199. [PubMed: 12124409]
80. O'Hara MW, Stuart S, Gorman LL, Wenzel A. Efficacy of interpersonal psychotherapy for postpartum depression. Archives of General Psychiatry 2000;57(11):1039–1045. [PubMed: 11074869]
81. Appleby L, Warner R, Whitton A, Faragher B. A controlled study of fluoxetine and cognitive-behavioral counselling in the treatment of postnatal depression. BMJ 1997;314(7085):932–936. [PubMed: 9099116]
82. Stowe Z, Nemeroff C. Women at risk for postpartum-onset major depression. American Journal of Obstetrics & Gynecology 1995;173(2):639–645. [PubMed: 7645646]
83. Cohen LS, Viguera AC, Bouffard SM, Nonacs RM, Morabito C, Collins MH, et al. Venlafaxine in the treatment of postpartum depression. Journal of Clinical Psychiatry 2001;62(8):592–596. [PubMed: 11561929]
84. Wisner KL, Hanusa BH, Perel JM, Peindl KS, Piontek CM, Sit DK, et al. Postpartum depression: a randomized trial of sertraline versus nortriptyline. Journal of Clinical Psychopharmacology 2006;26 (4):353–360. [PubMed: 16855451][see comment]
85. Weissman A, Levy B, Hartz A, Bentler S, Donohue M, Ellingrod V, et al. Pooled analysis of antidepressant levels in lactating mothers, breast milk, and nursing infants. American Journal of Psychiatry 2004;161:1066–1078. [PubMed: 15169695]
86. Sit DK, Wisner KL. Decision Making for Postpartum Depression Treatment. Psychiatric Annals 2005;35(7):577–584.
87. Wisner K, Zarin D, Holmboe E, Appelbaum P, Gelenberg A, Leonard H, et al. Risk-benefit decision making for treatment of depression during pregnancy. American Journal of Psychiatry 2000;157:1933–1940. [PubMed: 11097953]
88. Moses-Kolko E, Bogen D, Perel J, Bregar A, Uhl K, Levin B, et al. Neonatal signs after late in utero exposure to serontonin reputake inhibitors: Literature review and implications for clinical applications. JAMA 2005;293:2372–2383. [PubMed: 15900008]
89. Golden RN, Gaynes BN, Ekstrom RD, Hamer RM, Jacobsen FM, Suppes T, et al. The efficacy of light therapy in the treatment of mood disorders: a review and meta-analysis of the evidence. American Journal of Psychiatry 2005;162(4):656–662. [PubMed: 15800134][see comment]
90. Oren D, Wisner K, Spinelli M, Epperson C, Peindl K, Terman T, et al. An open trial of morning light therapy for treatment of antepartum depression. American Journal of Psychiatry 2002;159:666–669. [PubMed: 11925310]
91. Epperson C, Terman M, Terman J, Hanusa B, Oren D, Peindl K, et al. Randomized clinical trial of bright light therapy for antepartum depression: Preliminary findings. Journal of Clinical Psychiatry 2004;65:421–425. [PubMed: 15096083]
92. Bodnar LM, Sunder KR, Wisner KL. Treatment with selective serotonin reuptake inhibitors during pregnancy: deceleration of weight gain because of depression or drug?[erratum appears in Am J Psychiatry. 2006 Oct;163(10):1843]. American Journal of Psychiatry 2006;163(6):986–991. [PubMed: 16741197]
93. Bodnar LM, Wisner KL. Nutrition and depression: implications for improving mental health among childbearing-aged women. Biological Psychiatry 2005;58(9):679–685. [PubMed: 16040007]
94. Freeman MP, Hibbeln JR, Wisner KL, Brumbach BH, Watchman M, Gelenberg AJ. Randomized dose-ranging pilot trial of omega-3 fatty acids for postpartum depression. Acta Psychiatrica Scandinavica 2006;113(1):31–35. [PubMed: 16390366]
95. Freeman MP. Empowering women to collaborate in their mental health care. Journal of Clinical Psychiatry 2005;66(6):768. [PubMed: 15960572]
96. Dunn AL, Trivedi MH, Kampert JB, Clark CG, Chambliss HO. Exercise treatment for depression: Efficacy and dose response. American Journal of Preventive Medicine 2005;28:1–8. [PubMed: 15626549]
97. Patrick TE, Bryan Y. Research strategies for optimizing pregnancy outcomes in minority populations. American Journal of Obstetrics & Gynecology 2005;192(5 Suppl):S64–S70. [PubMed: 15891714]