2

GENERAL INTRODUCTION
PSYCHIATRIC DISORDERS DURING PREGNANCY AND POSTPARTUM

Claire AI Stramrood
Mijke P Lambregtse-van den Berg
Ad JJM Vingerhoets
Willibrord CM Weijmar Schultz
Maria G van Pampus
K Marieke Paarlberg

Submitted for publication

GENERAL INTRODUCTION:

PSYCHIATRIC DISORDERS DURING PREGNANCY AND POSTPARTUM

Pregnancy, childbirth and the postpartum period are supposed to be joyful times. However, they are also major life events that require many adjustments due to the new role of being a mother, which is accompanied by many physiological and hormonal changes. The transition to parenthood after having given birth is challenging for both women and men as a result of sleep deprivation, adjustments in conjugal relationships, new or increased parental responsibilities, potential physical trauma and traumatic experiences, and possible problems with (breast-)feeding or other child-related worries. While most adjustment issues are transient and within the normal range of difficulties, the development of psychiatric symptoms in women during pregnancy and after childbirth is not uncommon. Approximately 10% of women experience a major depressive episode during pregnancy or postpartum[1,2], 12% meet the diagnostic criteria for an anxiety disorder[3], 7.5% have severe fear of childbirth[4,5], and 1-2% develop a posttraumatic stress disorder (PTSD) following childbirth.[6] Sometimes these conditions are specifically linked to pregnancy and childbirth, and in other cases they are unrelated to pregnancy, and simply reflect the occurrence of mental disorders among women in their reproductive ages. Nonetheless, these conditions not only affect the women involved, they may also prevent secure attachment of the infant and affect the relationship with the partner.[7,8] Depending on the definition used and causality assumed, suicide and psychiatric disorders may be considered one of the leading causes of (late) maternal mortality in developed countries.[9-11]

The focus of this thesis is 'PTSD following childbirth'. In order to place this topic in a context with other psychiatric disorders, to understand the similarities and differences in underlying mechanisms, and to consider the effects of possible co-morbidities, this chapter provides a comprehensive overview of psychiatric disorders with characteristics specific to the peripartum period. Traditionally, literature distinguishes three postpartum psychiatric conditions: the 'maternity blues', postpartum depression (often incorrectly referred to as post*natal* depression), and puerperal psychosis. This, however, is an oversimplification of reality[12]. This chapter reviews a number of psychiatric disorders that frequently have their *onset or an increased prevalence* during pregnancy or postpartum, or often *intensify* during the peripartum period, and/or have *characteristics and symptoms* that are specific to pregnancy and puerperium. These include two categories of disorders and symptoms:

1. *Mood disorders*, including major depressive disorder (MDD), bipolar disorder, puerperal psychosis, and 'maternity blues';
2. *Anxiety disorders*, including obsessive-compulsive disorder (OCD), fear of childbirth (FoC), and PTSD.

Each section will review the main characteristics and symptoms of the condition, diagnostic tools, prevalence in the general population as well as during pregnancy/postpartum, risk factors, possible consequences, treatment options and prevention strategies. The most important facts are summarized in table 1.

Two fields of study fall beyond the scope of this chapter: stress during pregnancy, and psychopathology without distinct features during the peripartum period. Firstly, much is known regarding the biological and psychological pathways by which 'stress' and psychosocial problems (relationships, finances, work), not related to a psychiatric disorder, may affect pregnancy and delivery outcomes. Although the impact of these should not be underestimated, this chapter solely focuses on psychiatric conditions. Secondly, the characteristics of some psychiatric disorders are not distinctly different during pregnancy and the postpartum period than before pregnancy. Although women previously diagnosed with eating disorders, substance abuse disorders, attention deficit hyperactivity disorder (ADHD), personality disorders etc. may experience pregnancy, childbirth and puerperium as stressful periods, their conditions do not necessarily intensify or give rise to problems different from women without previously diagnosed mental disorders. Moreover, research into the manifestation of these conditions in the peripartum period is limited. Nonetheless, preconceptional counseling, vigilance with respect to potential derailment, and interventions to prevent exacerbations in the peripartum period should be included in the antepartum care these women receive. A recent Dutch study found that gynecologists' detection rate of women 'at risk' based on psychiatric history, current depressive symptoms, use of psychotropic medication, psychosocial stressors and substance abuse is about 1 in 5.[13] An initiative worth mentioning in this context are the Psychiatric-Obstetric-Pediatric (POP)-outpatient clinics that many hospitals in The Netherlands have established for women with pre-existing (as well as new) mental health conditions. In addition to gynecologists, psychiatrists and pediatricians, other relevant health care providers, such as social workers, psychiatric nurses and infant mental health specialists are involved in order to organize and coordinate care for expecting mothers and newborns.

MOOD DISORDERS

Whereas postpartum depression has, in part due to media attention, gained significant attention over the past years, a strong association has been reported between the occurrence of depression before and during pregnancy and depression during the postpartum period.[14] In a considerable number of cases, women already suffer from depression during pregnancy, or even before conception. Puerperal psychosis may be defined as a 'brief psychotic disorder with postpartum onset' according to the diagnostic and statistical manual of mental disorders, 4th edition (DSM-IV[15]), but will be discussed in this section on mood disorders given its strong association with bipolar disorder.[16,17] Finally, maternity blues comprises a set of symptoms frequently experienced by women during the first two weeks postpartum. It is not a psychiatric disorder, but a self-limiting condition that usually does not require treatment.

Table 1. Psychiatric disorders and symptoms specific to the peripartum period

	typical manifestation		prevalence	symptoms	self-report	treatment	note
	pregnancy	*postpartum*	(%)		measures		
Mood related							
Major Depressive Disorder (MDD)	yes	yes	7-13 [1, 2]	Depressed mood, loss of interest and pleasure in activities previously enjoyed. Altered sleep pattern, concentration, appetite, and feelings of guilt[15]	EPDS (29)	Pharmacotherapy (SSRI)[123] CBT/ Psychotherapy[123,239]	Frequent overlap with (physiological) somatic pregnancy complaints
Bipolar disorder (BD)	yes	yes	1-2 [125, 126]	Depressive episodes (see MDD) in conjunction with manic episodes: inflated self-esteem/grandiosity, little sleep, keeps talking, racing thoughts, distractibility, increase in goal-directed activity/ psychomotor agitation, excessive involvement in pleasurable activities that have a high potential for painful consequences[15]	-	Pharmacotherapy (mood stabilizers (lithium), antipsychotics, antidepressants, anticonvulsants)[132] CBT, IPT, FFT[149]	High risk (40%) of puerperal psychosis[17,128,129]
Puerperal psychosis (PP)	no	< 2 weeks	0.1-0.2 [153, 154]	Confusion, depersonalization, misrecognitions, loss of connection to reality, delusions, hallucinations, sleep deprivation, agitation, disorganized behavior, suspiciousness, thoughts or actions to harm oneself or the baby[128,150]	-	Pharmacotherapy (antipsychotics, mood stabilizers (lithium), anxiolytics (benzodiazepines))[157,159] Electroconvulsive treatment[157,158]	Related to bipolar disorder[17,128] Recurrence rate without medication 40-60%[17,160].
Maternity blues	no	< 2 weeks	15-85 [162]	Incontrollable tearfulness, mild depressive symptoms, anxiety, unstable moods, sorrow/weeping, and confusion[163,164]	-	Not necessary (self-limiting)	3-fold increased risk PPD or anxiety disorder[166]

Anxiety related							
Obsessive Compulsive Disorder (OCD)	yes	< 4 weeks	4 [172]	Obsessions (contamination, harming the infant) and compulsions (washing/cleaning, checking, avoidance)[171]	-	SSRI[184] CBT[184]	Peripartum period marks onset of disorder in 24-29% of women with OCD [178,179]
Fear of childbirth (FoC)	yes	yes*	7.5 [4, 5, 187]	Continuously dreading upcoming labor and delivery, anticipation of the delivery provokes an anxiety response (such as a panic attack), attempts to avoid childbirth (request for elective cesarean, pregnancy termination)[15]	WDEQ[189]	Psychotherapy[194,195]	Most often fear of negative appraisal, loneliness, lack of self-efficacy, lack of positive anticipation and death/injury/ handicap of the infant[190]
Posttraumatic stress disorder (PTSD)	yes*	yes	1-2 [6]	Delivery (subjectively) experienced as traumatic; re-experiencing/ intrusions, avoidance, numbing of affective responses, hyperarousal[15]	TES-B[200] PSS-SR[201]	EMDR[237] CBT[238]	Co-morbidity with PPD 50%[198]. More common in women with depression and fear of childbirth[191] and after preterm delivery, emergency CS[220]

Abbreviations:
CBT, cognitive behavioral therapy; CS, cesarean section; EMDR, eye-movement desensitization and reprocessing; FFT, family focused therapy; FoC, fear of childbirth; MDD, major depressive disorder; OCD, obsessive compulsive disorder; PPD, postpartum depression; PTSD, posttraumatic stress disorder; SSRI, selective serotonin reuptake inhibitor (category of anti-depressants)
* secondary to a prior traumatic delivery experience

Depression

Characteristics and Diagnosis

Major depressive disorder (MDD) is characterized by depressed mood and diminished interest or pleasure in activities that were previously enjoyed (anhedonia). Additional symptoms may include (a) insomnia/hypersomnia; (b) weight or appetite loss/gain; (c) psychomotor agitation/retardation; (d) fatigue or loss of energy; (e) feelings of worthlessness or inappropriate guilt; (f) diminished concentration or indecisiveness; (g) recurrent thoughts of death or suicide.[15] At least five of these symptoms should be present simultaneously for two weeks or more, and they must include depressed mood or anhedonia.[15] Minor depressive disorder is a mood disorder in which at least two depressive symptoms are present for two weeks, but in which the full criteria for MDD have not been met.[15] Mood and cognitive symptoms (sadness, loss of pleasure/enjoyment, irritable or anxious mood, pessimism, difficulty concentrating, lack of involvement, and fatigue) appear to be more common in minor depressive disorder than neurovegetative symptoms (changes in sleep/weight/appetite, psychomotor agitation/retardation and suicidal thoughts).[18]

While the criteria for depression during or outside the peripartum period do not differ, the DSM-IV does contain a specific category (code) for mood disorders "with postpartum onset", implicating that symptoms should commence within the first four weeks following childbirth. It is often argued to extend this period to three, six or twelve months after delivery, since elevated relative risks for first-time psychiatric hospital admission or outpatient contact have been found up to five months following childbirth compared to non-puerperal females in the same age group.[19] Although a vast body of literature is available on postpartum depression, researchers still do not agree whether depression during the peripartum period should be considered a distinct disorder or as an episode of 'regular' major depressive disorder that happens to have has its onset during the peripartum period.[20-25]

Assessment of depressive symptoms can be performed by psychologists or psychiatrists by means of a clinical interview such as the *Structured Clinical Interview for DSM-IV Disorders* (SCID)[26] or *Mini International Neuropsychiatric Interview* (MINI).[27] Trained non-professionals may use the World Health Organization's *Composite International Diagnostic Interview* (CIDI)[28]. In outpatient settings, one often chooses to use self-report measures due to their availability and ease in use. These intend to screen for, rather than diagnose, depression. Frequently used instruments include the Edinburgh (Postnatal) Depression Scale (E(P)DS)[29], Beck Depression Inventory second edition (BDI-II)[30], and Hospital Anxiety and Depression Scale (HADS)[31]. The E(P)DS is the most widely used screening tool in the peripartum period, which has been internationally validated for use during pregnancy[32] and postpartum in both women and men.[33] It assesses depressive symptoms during the previous week by means of 10 questions with 4 answer categories (scores 0-3). A cut-off value (sum-score) of 12-13 during the postpartum period[29] indicates 'probable' clinical depression. For screening during pregnancy, cut-off values ranging from 11[32] to 14-15[34,35] have been suggested in order to obtain an optimal balance between sensitivity and specificity. The BDI-II assesses depressive symptoms

during the preceding two weeks, includes all DSM-IV symptom criteria and allows for differentiation between somatic and non-somatic symptoms. It consists of 21 items containing four statements that reflect increasing symptom severity. A cut-off score of 20 (range 0-63) or more corresponds with moderate depression.[30] The HADS is a screening instrument for depression and anxiety. It has been designed particularly for the general hospital (somatic patient) setting, disregarding all possible somatic components of depression and anxiety in order to avoid confounding with symptoms of somatic conditions. It contains 7 items for depression and seven for anxiety, which are each rated on a 4 point scale (0-3). A cut-off value of 8 or more on each scale represents clinically relevant depression or anxiety.[36]

Mistaking genuine depressive symptoms in the peripartum period for typical somatic discomfort is a common error, and therefore requires diagnostic experience with this patient group. Alternatively, components of physiological pregnancy and postpartum period (changes in sleep pattern and appetite, difficulties concentrating, diminished energy levels) may erroneously be interpreted as somatic symptoms of depression.[21] As a consequence, physicians' rate of recognition of depression during the obstetric period is low.[13,37] The unfamiliarity with standardized screening instruments may play an additional role in the infrequent detection of depression by obstetric care professionals.[38] What may further complicate an adequate diagnosis is that, even when asked, women themselves may be reluctant to admit that they are not excited about their pregnancy or newborn.

Prevalence

Mood disorders are more prevalent in women than in men, irrespective of pregnancy, fertility status or age. Results of the World Mental Health survey[39], for which 72.933 individuals in 10 developed and 5 developing countries were interviewed, revealed that women are 1.8 times more likely to develop MDD at some point in their lives than men. Pregnancy is a time of increased vulnerability for a major depressive episode in women with a history of depression.[40-42] It remains a topic of vigorous debate whether or not women are *more likely* to develop a major depressive episode during the peripartum period, and whether pregnancy/delivery is the *cause* of depression. Two large systematic reviews have critically discussed the prevalence of MDD during pregnancy and the postpartum period. Bennett *et al.* (2004)[2] reviewed 21 studies that used clinical interviews or self-report measures, and calculated 3-month prevalence rates for MDD (including 95%CI) of 7.4% (2.2-12.6), 12.8% (10.7-14.8) and 12.0% (7.4-16.7) for the first, second and third trimesters, respectively. Gavin *et al.(*2005)[1] summarized 28 prospective studies that used clinical interviews or clinical assessment (i.e. excluding self-report questionnaires). At some point during their pregnancy (i.e., 9-month prevalence), 12.7% of women were found to have an episode of MDD, with 7.5% of women reporting the onset of the episode during pregnancy. During the first three months postpartum, the prevalence of MDD was 7.1% and most of these episodes had their onset following delivery.[1]

Large population studies that made use of clinical interviews have provided estimates of the 1-year prevalence of MDD in women. Researchers in six European countries and the USA found 1-year

prevalence rates for MDD of 5.3 (n=21425[43]), 6.9 (n=43093[44]) and 7.7% (n=5554[45]), respectively. The combined findings of these population studies and the abovementioned systematic reviews with 3-month[2] and 9-month[1] prevalence rates of 13% during pregnancy and 7% postpartum, suggest that MDD is (a) more common during pregnancy than postpartum, and (b) more common in pregnant than in non-pregnant women. However, a large US study[3] compared the prevalence of psychiatric disorders in a sample of pregnant (n=453) and postpartum (n=994) women to women who had not been pregnant (n=13025) in the year prior to data collection. *Lower* rates of mood disorders were found among pregnant women than among non-pregnant women, but *higher* rates of MDD in postpartum women than in non-pregnant women (9.3% vs. 8.1%, adjusted OR 1.52, 95%CI 1.05-2.15). Combining the data does not allow for a decisive conclusion on whether or not the prevalence of MDD is increased during pregnancy and postpartum.

Risk factors and consequences

As is the case with most psychiatric disorders, risk factors for depression in pregnant and postpartum women seem to be similar to the risk factors for depression in non-pregnant women. *Somatic causes* for depressed mood should always be evaluated in women presenting with postpartum depression. Several studies have demonstrated associations between clinical and subclinical thyroid dysfunction and depression during pregnancy or the postpartum period.[46-52] Furthermore, observational and experimental data suggest that reproductive hormonal changes during parturition and the postpartum period (notably estradiol and progesterone) may trigger depression in a subgroup of women sensitive to the mood destabilizing effects of gonadal hormones.[53,54] A recent US study found that vitamin D deficiency was associated with clinically significant symptoms of depression in pregnant African American women (OR 0.54, 95%CI 0.29-0.99).[55] With respect to *psychological factors*, literature has previously described that women with a history of depression are at an increased risk of relapse during pregnancy.[56] Risk factors for postpartum depression further include previous (postpartum) depression, depression during pregnancy, prepartum distress, social isolation and disturbed relationships.[57]

The association between MDD during the peripartum period and poor outcomes, which may affect both mother and child, warrant vigilance and screening of women for (increased risks of developing) depression. *Depression during pregnancy* is associated with unhealthy parental behaviors[58], preeclampsia[59] and higher rates of postpartum depression.[60-62] Whether or not depression may cause preterm birth is controversial. A meta-analysis[63] summarized the findings of 20 studies to a relative risk of 1.13 (95%CI 1.06-1.21), but noted that effect sizes in studies using dichotomous measures of depression were larger than in studies with continuous measures. Other studies compared depressed women, women using selective serotonin reuptake inhibitors (SSRIs), and healthy pregnant controls, and found no increased risk of preterm birth (OR 1.2, 95%CI 0.68-2.10[64]; OR 1.1, 95%CI 0.77-1.59.[65] Recent findings (Quispel, submitted) suggest that both depression and preterm birth may have similar predictive factors (among which low education level) that give

an increased likelihood for preterm birth, rather than depression being the cause of an increased incidence of preterm delivery.

Postpartum depression has been associated with serious disturbances in mother-child interaction, i.e. less sensitivity and engagement of the mothers and less responsiveness to the infants[8], thoughts of harming the child and the use of harsher punishments[66,67], compromised care giving activities, e.g. cessation of breastfeeding, feeding difficulties, unhealthy sleep routines and fewer vaccinations.[68-72] Furthermore, children of depressed mothers more often show poor cognitive functioning, behavioral inhibition, lower social competence, lower school adjustment and emotional maladjustment, as compared to children of healthy mothers.[73-77]

Treatment and prevention

Treatment of depression during pregnancy and postpartum is justified, since a state of clinical depression may negatively affect fetal and infant development.[78] Most applied treatments include pharmacological and non-pharmacological interventions, in addition to psycho-education aimed at promoting a healthy lifestyle. Often, women as well as physicians hesitate to start or continue the use of antidepressant medication during pregnancy, since data on long term effects of antidepressants on the fetal development are not unanimous.[79] It is therefore necessary to consider the effects of treatments that are potentially harmful for the newborn, against prolonging the state of being mentally unhealthy with possible adverse effects on the fetal and infant development as well. Additionally, in women with a history of depression, the risk of relapse with and without medication should be evaluated in making a decision whether or not to commence or discontinue the use of antidepressants.

Most studies on the use of antidepressants during pregnancy and postpartum focus on selective serotonin reuptake inhibitors (SSRIs), which have a well established efficacy for cases of MDD.[80] Considerable controversy exists with regard to a potential increased risk of developing persistent pulmonary hypertension of the newborn (PPHN) in infants of women taking SSRIs during pregnancy.[81,82] Recent data[83] suggest a two-fold increased risk of PPHN after SSRI use in pregnancy (OR 2.1; 95%CI 1.5-3.0). However, absolute risks remain very low: 1.2 infants with PPHN per 1000 without SSRI versus 3.0 per 1000 with SSRI. Literature has also suggested that depression itself, rather than SSRI use, may account for the increased incidence of PPHN in depressed mothers[81].

Infants of depressed mothers exposed to SSRIs appear to have a different neurobehavioral profile than women with MDD who did not take SSRIs during pregnancy.[84] On the long term, similar neurodevelopmental outcomes are to be expected.[85] Some studies report associations between maternal SSRI usage and childhood psychopathology, for example with autism spectrum disorder (OR 2.5, 95%CI 1.1-5.5).[86] However, other research suggests that maternal depression predicts child cognitive and behavioral outcome independent of antidepressant usage[87,88], and also that fetal

neurodevelopmental programming is influenced by maternal depression, without mediating effects of SSRI use.[89]

SSRIs have also been said to increase the risk of congenital malformations. However, recent research[90] comparing women exposed to SSRIs throughout the first trimester of pregnancy and women who discontinued antidepressants prior to conception, found similar rates of major congenital malformations and cardiac defects in both groups, but a twofold increase compared to women who had not used SSRIs during or shortly before pregnancy . The study concludes that there may be other confounding factors in women with an indication for SSRI use.

Whether or not SSRI use during pregnancy increases the risk of preterm birth is controversial. A US study (n=2793)[64] found that the use of a SSRI, both with (OR 2.1, 95%CI 1.0-4.6) and without (OR 1.6, 95%CI 1.0-2.5) a major depressive episode, was associated with preterm birth. A Dutch study[65] (n=7696) also demonstrated that SSRI exposure increased the risk of preterm birth (OR 2.14, 95%CI 1.08-4.25) and affected head growth, while exposure to depression had a negative effect on overall growth. The association between SSRI use and preterm birth seems to be facilitated by the level of depressive symptoms, as well as sociodemographic and lifestyle factors.[91] After adjusting for these factors, exposure to antidepressants during pregnancy (n=699) was not associated with increased risk of preterm birth (adjusted OR, 1.21; 95%CI, 0.87-1.69) or low birth weight (adjusted OR, 0.62; 95%CI, 0.33-1.16) compared to women who did not use antidepressants during pregnancy (n=62696).

The possible role of antidepressants in the prevention of relapse is likely to be dependent on a greater number of previous episodes of major depression[92] and severity of symptoms, but is nonetheless controversial. One study (n=201) reported that pregnant women with a history of MDD who were not depressed during the first trimester of pregnancy, were more likely to relapse during pregnancy when discontinuing medication shortly before or during pregnancy, as compared to women who continued medication (68 vs. 26%; hazard ratio 5.0, 95%CI 2.8-9.1).[93] Another study with similar inclusion criteria (n=778) found that failure to use or a decision to discontinue the use of antidepressants in pregnancy did not have a strong effect on the development of a major depressive episode (hazard ratio 1.14; 95%CI 0.67-1.50) compared to women who used antidepressants throughout pregnancy.[92] There is no evidence for the efficacy of medication in the treatment of minor depression.[94]

With regard to psychosocial and psychological interventions, a 2007 Cochrane review[95] concluded that currently, there is insufficient research to conclude whether or not non-pharmaceutical interventions are effective in treating *antepartum* depression. More recently, two pilot studies have been published showing promising results of mindfulness-based stress reduction interventions on symptoms of depression and anxiety in pregnant women.[96,97] Cochrane reviews revealed that, based on 956 subjects of nine trials combined, psychotherapy and psychosocial interventions are effective

in treating *postpartum* depression.[98] A meta-analysis[99] concluded that interventions including an interpersonal therapy (IPT) component were found to have greater improvement in depressive symptoms, compared to control conditions, than interventions including a cognitive behavioral component.

IPT is based on attachment and interpersonal theory[100], and assumes that "patients' maladaptive communication patterns lead to difficulties in their current interpersonal relationships".[101] In the context of pregnancy and postpartum period, IPT may target the gap between the desired and perceived social support of women.[42] In comparison to parenting education program, IPT was associated with a reduction in the risk of depressive symptoms among pregnant women with diagnosed MDD.[102] IPT during pregnancy as compared to enhanced care as usual, led to significant reductions in depressive symptoms and MDD diagnoses during pregnancy and postpartum, and showed significant improvements in social functioning at six months postpartum.[103] Among women with PPD, IPT resulted in a significantly greater proportion of recovery (defined as a BDI score of 9 or lower) compared to waitlist-controls (43.8% and 13.7%, respectively).[104] It also appears that the effects of IPT remain over a longer period of time.[105]

A multitude of complementary and alternative medicine treatments for MDD have been evaluated, some of which have also been conducted in pregnant and postpartum women, usually on a small scale. Several reviews[106-109] have summarized research on the possible role of *omega-3 suppletion* in treatment and prevention of antepartum and postpartum depression, concluding that evidence is ambiguous. *Light therapy* is a well established treatment option for MDD outside pregnancy and the postpartum period.[110-112] Women with MDD during pregnancy report significantly lower relapse rates when receiving light therapy when compared to women who receive regular 'ineffective' light.[113] The effects of *hormone therapies* (estrogen, progesterone) on treating and preventing depression during pregnancy and postpartum are insufficiently researched.[114,115] A systematic review[116] concluded that the effects of *acupuncture* as monotherapy and antidepressants were comparable with respect to improving clinical response and alleviating symptom severity of MDD, but the results of acupuncture were not different from sham acupuncture. Studies involving pregnant women with MDD found greater symptom reduction in acupuncture treatment groups than in waitlist-controls or women receiving massage therapy. However, the differences between women receiving depression-specific acupuncture and control (non-specific) acupuncture were not always statistically significant.[117,118] Case series and pilot studies have provided limited evidence for the efficacy and safety of *electroconvulsive therapy* (ECT) in pregnant[119] and postpartum[120] women with severe depression, who were unresponsive to pharmacological treatment and often have additional psychotic features.

Prophylaxis with antidepressants seems to be effective to prevent MDD[121-123], and it is therefore necessary to identify those at risk of developing MDD. A comprehensive Cochrane review concluded that there is insufficient evidence for the use of psychosocial interventions to prevent MDD.[124]

However, identifying and focusing psychosocial interventions on mothers 'at-risk' for PPD is more effective in preventing PPD (RR 0.67, 95%CI 0.51 to 0.89) than targeting all women (RR = 0.87, 95%CI 0.66 to 1.16).[124]

Bipolar disorder

Characteristics and diagnosis

Bipolar disorder (BD) is a mood disorder characterized by manic episodes, often alternated with depressive episodes – hence its previous term 'manic depression'. The DSM-IV[15] distinguishes 2 types of BD: Bipolar I disorder, during which individuals have experienced at least one manic or mixed episode; Bipolar II disorder, during which individuals have experienced one or more hypomanic episodes in addition to at least one depressive episode (as described under MDD). A (hypo)manic episode is characterized by at least three of the following seven symptoms: (a) inflated self-esteem or grandiosity; (b) decreased need for sleep; (c) pressure to keep talking; (d) flight of ideas or subjective experience that thoughts are racing; (e) distractibility; (f) increase in goal-directed activity or psychomotor agitation; (g) excessive involvement in pleasurable activities that have a high potential for painful consequences. Hypomanic episodes do not extensively impair daily life (social and professional) functioning, do not require hospitalization and do not include psychotic components[15], which makes them easier to go unnoticed by health care professionals than manic episodes.

Prevalence

Epidemiological studies estimate lifetime prevalence rates of 0.6–1% for bipolar I disorder, and 0.4-1.1% for bipolar II disorder.[125,126] A substantial amount of women experience a relapse during pregnancy (22%) or postpartum (24%), despite adequate medication in most cases.[127]

Risk factors and consequences

Clinicians should be vigilant of the close link between BD and postpartum psychosis (PP)[16]: 40% of women with BD develops PP[17,128], which is a 100-fold increase when compared to non-bipolar women.[129] In some women a postpartum psychosis marks the onset (i.e. is the first episode) of later diagnosed bipolar disorder.[17,128] Among women with BD, the likelihood of developing PP is doubled in case of a family history of PP.[17] BD has been associated with adverse pregnancy outcomes, as a recent study found that induction, elective cesarean section and neonatal hypoglycemia were more common among women with BD, regardless of whether or not they used mood stabilizers.[130]

Treatment and prevention

A wide range of pharmacological treatments are available for those suffering from BD. A key component in the effective management of BD patients is the mood stabilizer lithium, also during pregnancy and postpartum.[127] The risk of relapse during pregnancy is approximately doubled in

women without medication (40-85.5%), compared to women using medication (19-37%).[127,131] Depending on the mental state of the patient (mania/depression; acute/prophylaxis), additional drugs can be prescribed, including atypical antipsychotics, antidepressants and anticonvulsants.[132]

Weighing the risks and benefits of continued use of medication during pregnancy versus discontinued pharmacological treatment should be done with care, as is the case with depression. Untreated bipolar disorder has been associated with preterm birth and low birth weights.[133] The overall incidence of congenital defects does not seem to be altered with the use of lithium, although there is evidence that the incidence of cardiac malformations is increased[134,135], and anecdotal evidence suggests increased risks of other conditions as well[136]. Furthermore, monitoring of plasma lithium concentrations and thyroid function is warranted during pregnancy, as lithium may not only deregulate maternal thyroid function[137], but also increase glomerular filtration rate and creatinin clearance during pregnancy, resulting in lower concentrations of circulating lithium. High serum lithium concentrations prior to delivery have been associated with lower APGAR scores and central nervous system complications in the neonate, with adverse effects proportional to the dosage of lithium, which is the reason that a 24-48 hour interruption of lithium intake prior to delivery has been suggested[138]. Anticonvulsants are known for their teratogenic effects on embryonic and fetal development[139,140], whereas antipsychotics increase the risk of gestational diabetes.[141,142] The long term effects on infant development vary depending on the type of medication, ranging from lower intelligence levels after use of the anticonvulsant valproic acid[143-145], to macrosomia at birth[141, 146] and deficits in neuromotor development[147] for antipsychotics, to no significant long term effects on growth, cognitive, behavioral and neurological development for lithium[148].

A number of psychological interventions have been found effective for treating bipolar disorder, ranging from cognitive behavioral therapy (CBT) and IPT to family focused treatment.[149] Their effectiveness in pregnancy and postpartum has not researched extensively.

Puerperal psychosis

Characteristics and diagnosis

Characteristics of puerperal psychosis (PP) include confusion, depersonalization, misrecognitions, loss of connection to reality, delusions (false beliefs held with absolute conviction, despite evidence proving otherwise), hallucinations (perceptions in the absence of a stimulus, usually visual or auditory), sleep deprivation, agitation (sometimes manic), disorganized behavior, suspiciousness, and thoughts or actions to harm oneself or the baby.[128,150] In the DSM-IV, *postpartum (or puerperal) psychosis* is not described as a separate disease entity, and is therefore frequently categorized as either psychotic disorder not otherwise specified, brief psychotic disorder, or mood disorder (manic, mixed, or major depressive episode) with psychotic features, all requiring the specifier “with postpartum onset” (4 weeks or less after delivery).[127,151,152]

Prevalence

PP is a condition that affects approximately 1-2 per 1000 women after childbirth.[153,154] The onset is usually within the first two weeks after delivery[155,156], with a median of 8 days postpartum.[151]

Risk factors and consequences

As previously mentioned, a close link exists between PP and bipolar disorder (BD). In addition to BD being a risk factor for the development of PP, PP may also mark the onset of later diagnosed bipolar disorder.[17,128] Often there is a familial occurrence of PP.[16]

Among women with PP, the prevalence of auto-immune thyroid disorder (AITD, defined as elevated concentrations of thyroperoxidase (TPO) antibodies) and clinical thyroid failure (abnormal values of both TSH and fT4) is clearly increased.[152] There was a significant difference between the prevalence of AITD among women with PP at 4 weeks postpartum (19%) versus healthy postpartum controls (5%). Furthermore, at 9 months postpartum, 19% of women with PP were diagnosed with clinical thyroid disease versus 3% of healthy controls. It was suggested that AITD may be an etiological factor for the development of PP, and therefore evaluation of thyroid function including TPO antibodies is warranted.

Treatment and prevention

Management of PP usually includes hospital admittance, to rule out possible organic causes and to prevent suicide and infanticide from occurring. Treatment often comprises a combination of prescription of (atypical) antipsychotic medication, mood stabilizers (lithium), anxiolytics (benzodiazepines), and, in severe cases, electroconvulsive treatment.[157-159] The recurrence rate without treatment is approximately 40-60%.[17,160] In many cases, prophylactic use of lithium immediately after delivery can effectively prevent a new episode of PP.[127,161]

Maternity blues

Maternity blues is not a mental disorder, rather, it is a transitory psychological condition experienced by 15-85% of mothers during the first days after childbirth.[162] Characteristics include incontrollable tearfulness, mild depressive symptoms, anxiety, unstable moods, sorrow/weeping and confusion.[163,164] The symptoms women experience during the 'maternity blues' have been related to the radical changes in hormone levels immediately postpartum.[165] Symptoms should disappear within two weeks and generally do not require intervention. However, if the symptoms persist, women have an increased risk of developing postpartum depression (20%; OR 3.8, 95%CI 1.2-16.5) or an anxiety disorder (OR 3.9, 95%CI 1.1-20.0).[166]

ANXIETY DISORDERS

Both anxiety disorders and mood disorders reveal a higher prevalence in women than in men. The results of the World Mental Health survey[39], for which 72.933 individuals in 10 developed and 5 developing countries were interviewed, showed that women are 1.7 times more likely to develop an anxiety disorder at some point in their lives than men. Whereas a vast body of research is available regarding peripartum depression, the literature on anxiety disorders in the peripartum period is far less substantial. Recently, a large population-based study found no significant difference in the prevalence of DSM-IV anxiety disorders between 1.524 women who had been pregnant the year before assessment and 13.025 women who had not (13% and 15%, respectively; adjusted OR, 0.99 (95%CI 0.68-1.43)).[3] Importantly, PTSD and OCD were not part of this study. Nonetheless, the physiological, hormonal, and psychosocial changes that occur in the peripartum period may increase perceived stress levels, thereby eliciting symptoms in women vulnerable for developing anxiety disorders. Regardless of the likelihood of an increase in (symptoms of) anxiety disorders during the peripartum period, anxiety is common among childbearing women, and is associated with changes in fetal behavior, a higher incidence of pregnancy complications, and difficulties in adjustment postpartum in both mother and child.[167]

Research regarding the precise effects of anxiety disorders during pregnancy on obstetric, fetal and neonatal outcome has yielded varying results. Among others, this is related to differences in sample characteristics, timing, specific measures, and accounting for possible confounders (e.g., 'stress') and protective factors in the various studies. Furthermore, criteria for anxiety varying from higher than average scores on self-report measures, to specific DSM-IV anxiety disorders, to any DSM-IV anxiety disorder have been used. Nonetheless, as a comprehensive review concluded[168], "anxiety symptoms during pregnancy contribute independently of other biomedical risk factors to adverse obstetric, fetal and neonatal outcome".

In practice it is useful and necessary to distinguish between (a) women with a history of anxiety symptoms or a diagnosed anxiety disorder (whose symptoms during the peripartum period may be regarded as recurrent), and (b) women who were (relatively) well adapted before pregnancy, and experience *de novo* anxiety symptoms. In the latter case it may mean the onset of an anxiety disorder, or of pregnancy related anxiety, which is markedly different from general anxiety and depressive symptoms.[169] Three anxiety disorders have characteristics specific to the peripartum period: (1) obsessive-compulsive disorder (OCD) often has its onset in the peripartum period; and with (2) fear of childbirth (FoC) and (3) posttraumatic stress disorder (PTSD) following childbirth the object of women's fear or trauma is related to delivery and childbirth.

Obsessive-compulsive disorder (OCD)

Characteristics and diagnosis

OCD is an anxiety disorder characterized by unwanted, intrusive thoughts and/or images (obsessions) and repetitive physical or mental activities that one feels forced to carry out (compulsions).[15] During pregnancy, OCD often manifests itself as a preoccupation with contamination and symmetry/meticulousness (obsessions) and subsequent repetitive washing/cleaning behavior and checking (compulsions).[170,171] During the postpartum period, OCD often manifests as intrusive thoughts about harming the infant, or the child dying in its sleep (obsessions), followed by excessive checking (of breathing and heart rate) or avoidant behavior (compulsions).[171,172] It is important to note that subclinical intrusive, senseless, obsessive thoughts and compulsive behavior are also found in women without OCD, depression, puerperal psychosis or other psychiatric disorders.[67,171] From a cognitive-behavioral perspective, these thoughts and behaviors become clinically relevant when an individual (mis)appraises such thoughts as highly significant and threatening, and requiring attention to prevent a feared negative consequence.[173]

MDD is the most commonly diagnosed co-morbid diagnosis in non-gravid patients with OCD, with a lifetime prevalence of 60-80%.[174] Women with pre-existing OCD may also be at increased risk of developing postpartum depression.[175] Although both OCD and MDD are associated with negative affect, the obsessions in OCD usually pertain to specific bizarre fears and/or negative consequences, whereas thoughts in depression are pessimistic in general and predominantly concern real life circumstances.[171] It is important to distinguish between the different features of aggressive thoughts towards the infant as seen in OCD and puerperal psychosis. Thoughts and behavior in OCD are *ego-dystonic*, causing fear and distress.[171] Women with OCD experience their obsessions with harming the child as unwanted, senseless and inconsistent with their typical behavior, they realize that their thoughts and imaginations are the product of their own mind, and will rather avoid the child in response to their own aggressive thoughts than act upon them.

Prevalence

The lifetime prevalence of OCD is estimated at 1.6%.[176] Prevalence estimates of OCD during the peripartum period are scarce. During the third trimester of pregnancy a prevalence of 3.5%[170] has been found, and postpartum incidences of 2.3 and 4% have been reported.[172,177] The peripartum period marks the onset of symptoms in a substantial number of women diagnosed with OCD. In several small retrospective studies (17-78 patients), 6-39% of women with at least one child connected the onset of their OCD to their pregnancy[175,178-181], whereas 0-22% reported their first OCD symptoms to occur during the postpartum period.[175,178,179,181] Women with preexisting OCD often report worsening of their symptoms during the peripartum period. In various studies, 8-34% of women indicated exacerbations during pregnancy, and 29-50% reported worsening of symptoms during the postpartum period.[175,178,179]

Risk factors and consequences

Neurobiological substances that are thought to be involved in the etiology of OCD include serotonin and oxytocin. In a substantial number of women, the onset or worsening of OCD seems to be related to reproductive cycle events, especially postpartum and menarche.[178,180] Furthermore, 20-50% of women report worsening of OCD during the premenstrual period.[175,178] This observation has led to the hypothesis that fluctuations in estrogen and progesterone levels may cause OCD symptoms through dysregulation of the serotonergic system.[182] Moreover, increases in oxytocin during the third trimester of pregnancy and postpartum are related to the increase of OCD symptoms during that period.[183]

Treatment and prevention

Treatment options of OCD during the peripartum period include psychotherapy (CBT), and, if this proves insufficiently effective, pharmacotherapy (SSRIs).[184] The risks and benefits of SSRI usage in women during pregnancy and lactation have been discussed in the section on MDD. The focus during CBT lies on exposure to feared situations and prevention of compulsive responses. In non-postpartum populations, the combination of both treatments has been shown to be most effective[185], but in postpartum populations no RCT´s have been conducted yet.

Fear of childbirth (FoC)

Characteristics and diagnosis

Fear is a common reaction to childbirth, which demands much from the biological, psychological and social abilities of the pregnant woman.[186] In a significant minority of women, this healthy, functional apprehension takes the pathological, impairing, distressing form known as 'severe fear of childbirth' or tocophobia.[187,188] These women meet the DSM-IV criteria for specific phobia[15] if they continuously dread the upcoming labor and delivery, even though they realize that their fear is excessive and unreasonable; anticipation of the delivery provokes an anxiety response (such as a panic attack), and they try to avoid childbirth (e.g. by demanding an elective cesarean, avoiding or terminating pregnancy) and/or suffer throughout childbirth with intense fear. One could distinguish between *primary* and *secondary* FoC, with the former occurring in nulliparous women who have never given birth, and the latter in multiparous women following a previous traumatic delivery experience. Screening for FoC can be done with the use of the Wijma Delivery Expectations/ Experience Questionnaire (WDEQ), a validated, frequently used, easily-administered self-report questionnaire.[189] A sum-score of 85 or higher indicates severe FoC. Several domains have been identified around which the fear is centered. Factor analysis identified 6 factors that comprise the 'FoC' construct[190]: (a) (general) fear, (b) negative appraisal, (c) loneliness, (d) lack of self-efficacy, (e) lack of positive anticipation and (f) concerns for the child. Similar results were obtained by Huizink[169], who found that women fear not only giving birth, but also bearing a handicapped child, and they are concerned with their appearance.

Prevalence

FoC is more common in nulliparous women than in multiparous women.[4,5] In unselected samples, severe FoC is reported by approximately 7.5% of women. A Norwegian study[4] among 2206 women found a prevalence of 7.5% for severe FoC (WDEQ-A ≥85), further subdivided into 9.0% of nullipara and 5.9% of multipara (p=.009). In a Finnish cohort of 1400 women, 7.4% revealed a WDEQ-A score of ≥100[5], which could be subdivided into 7.0% of nullipara and 7.7% of multipara (p-value not mentioned), although median WDEQ scores of nullipara were higher than multipara (72.0 vs. 65.4, p<0.001). This study also used a visual analogue scale (VAS) to screen for FoC, by asking women to indicate on a scale from 1 to 10 "how afraid [they were] of childbirth". The VAS showed a sensitivity of 97.8% and specificity of 65.7% in screening for FoC (WDEQ ≥ 100) with a VAS threshold of 5.0. In a sample of 30480 healthy nulliparous Danish women with a singleton pregnancy, 7.5% answered the question "Are you anxious about the course of the upcoming delivery?" with "a lot".[187]

Risk factors and consequences

Risk factors for FoC include a history of depression and of sexual abuse, low self-esteem and coping abilities, poor social support system, as well as a previous traumatic delivery experience.[187] Labor duration is significantly longer in women with severe FoC.[4] Additionally, women with FoC have a six-fold increased risk of developing PTSD.[191] Furthermore, several studies find an increased risk of emergency cesarean section in women with severe FoC. In a sample of 25.297 healthy nulliparous Danish women in spontaneous labor with a single fetus in cephalic presentation at term following an uncomplicated pregnancy, FoC (as measured at 16 and 31 week pregnancy) was associated with emergency cesarean section (OR 1.43, 95%CI 1.13–1.80).[192] In a sample of 1.981 Swedish-speaking women (both nulliparous and multiparous), women with FoC were more likely to undergo emergency cesarean section than women without FoC (OR 3.0, 95%CI 1.4-6.6).[193]

Treatment and prevention

Research into optimal intervention and prevention strategies with respect to FoC is ongoing. A limited number of studies have found promising effects (reduction of elective cesarean requests, shorter duration of labor) through the use of individual psychotherapy and group psycho-education and relaxation.[194,195]

Posttraumatic Stress Disorder (PTSD)

Characteristics and diagnosis

PTSD is an anxiety disorder that can develop after exposure to a traumatic stressor. In order to diagnose PTSD following childbirth, specific criteria have to be met, as described in the DSM-IV, outlined in table 2.[15] In addition to symptoms of re-experiencing, avoidance/ numbing and hyperarousal, the diagnosis of PTSD requires a genuine or perceived threat to the life of self or others; that the threat elicited a subjective response of intense fear, horror, or helplessness; that the symptoms persist for at least a month; and that the symptoms interfere with daily life functioning. PTSD commonly co-occurs with major depressive disorder[196,197], and is often seen in conjunction

with postpartum depression in puerperal women.[198,199] As with other disorders, the SCID[26] or MINI[27] can be used by psychiatrists and psychologists to diagnose PTSD. Additionally, numerous self-report instruments are available, some of which have been designed specifically for PTSD following childbirth[200], whereas others are generic questionnaires that can be used to diagnose PTSD following a variety of traumatic events[201-203] or broad instruments that contain PTSD-related items.[204,205]

Table 2. DSM-IV diagnostic criteria for PTSD

A	**Stressor**	1. Trauma involved actual or threatened death/serious injury, or threat to physical integrity of self or other
		2. Individual responded with intense fear, helplessness and/or horror
	Symptoms	
B	Re-experiencing	1. Recurrent and intrusive distressing recollections of the event
		2. Recurrent distressing dreams of the event
		3. Acting or feeling as if the event was recurring (e.g., flashbacks, hallucinations)
		4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the event
		5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the event
C	Avoidance & numbing	1. Efforts to avoid thoughts, feelings, or conversations associated with the event
		2. Efforts to avoid activities, places, or people that arouse recollections of the event
		3. Inability to recall an important aspect of the trauma
		4. Diminished interest or participation in significant activities
		5. Feeling of detachment or estrangement from others
		6. Restricted range of affect
		7. Sense of foreshortened future
D	Hyperarousal	1. Difficulty falling or staying asleep
		2. Irritability or outbursts of anger
		3. Difficulty concentrating
		4. Hypervigilance
		5. Exaggerated startle response
E	**Duration**	One month or more
F	**Disability**	Symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning

Prevalence

Studies performed between 1 and 6 months postpartum have yielded prevalence estimates of PTSD following childbirth ranging from 0.0% to 5.9%[200,206-216], although experts consider 1-2% as a more realistic estimate in developed countries.[6] Another 22-40% of postpartum women do not meet all criteria for PTSD, but do suffer from one or more clinically relevant symptoms of PTSD.[6]

Risk factors and consequences

Previous studies have identified multiple obstetric, personality and psychosocial factors that promote the development of PTSD following childbirth. Demographic factors such as age, marital status and educational level, on the other hand, were consistently found to be unrelated to PTSD following childbirth.[200,208,212,213] Women with a history of childhood sexual abuse seem to be at increased risk for developing symptoms of PTSD postpartum.[217,218] No associations have been observed between parity and PTSD.[208,209,211-213] A dose-response relationship between the intensity of the event and the risk of developing PTSD has been suggested.[219] Accordingly, one may postulate that the prevalence of PTSD is higher among women with complicated pregnancies, as these women have often been exposed to stressful interventions and hospitalization of mother and infant. Indeed, obstetric interventions (e.g. emergency cesarean section and instrumental vaginal delivery) did increase the risk of posttraumatic stress symptoms[191,207,220], as did complications such as preeclampsia and preterm birth.[221-224] However, although the relative risk of developing PTSD following obstetric complications is elevated, in absolute numbers, PTSD is still most prevalent among women with spontaneous vaginal deliveries, during which no medically or objectively identifiable complications occurred.[191]

While the possible influence of personality characteristics and psychological factors such as general state anxiety, trait anxiety and some specific coping strategies is controversial[209,211,213,225,226], strong associations have consistently been found between anxiety/depression during pregnancy and PTSD after childbirth.[211,212,216] Half of the women with PTSD following childbirth show a co-morbid PPD.[191,198] There appears to be a concordance between women and their partners in experiencing PTSD symptoms following childbirth, as well as an association between PTSD symptoms and dissatisfaction with partner support.[227] Furthermore, the perceived degree of support, care, and communication from the staff who assisted during labor seem to play crucial roles in the way women reflect on the experience.[213] This provides an interesting opening for further research, as obstetric care practice may not merely be targeted at identifying women 'at risk', but also focus on strategies to prevent the development of PTSD that are linked to empathic care, women's involvement in decision making, and strengthening partner support.

Delivery settings substantially influence women's appraisals of childbirth: a recent Cochrane review[228] concluded that, compared to conventional hospital settings, women who delivered in a homelike setting reported higher satisfaction about the birthing process and had lower intervention

rates. Obstetric health care in The Netherlands comprises a fairly unique echelon system. All healthy women with uncomplicated medical and obstetrical histories enter the primary care system, where pregnancy and delivery are monitored by community midwives working independently from hospitals. Only in case of (an increased risk for) well/defined complications or need for interventions during pregnancy or delivery (as defined by national guidelines[229]), women are referred to a gynecologist/obstetrician in a hospital. In the primary care setting, women can choose to deliver at home (23%), or in a homelike setting in a hospital or birth center (11%).[230] Women who initially or entirely received prenatal and/or peripartum care from midwives in primary care settings describe their delivery experience as more negative after (a) hospital deliveries (compared to home births), (b) referral to the hospital during labor, (c) emergency cesarean sections and (d) instrumental vaginal deliveries.[231]

Symptoms in women with PTSD following childbirth usually do not spontaneously fade out.[211] Possible consequences of (untreated) PTSD following childbirth include impaired bonding to the child, problems in the partner relationship[232], avoidance of future pregnancies and demanding an elective cesarean section (due to secondary fear of childbirth) during the next pregnancy.[195,233,234]

Treatment and prevention

Due to insufficient research thus far (both qualitatively and quantitatively), no standard intervention with proven effectiveness is currently available for women with PTSD following childbirth. International guidelines on the management of PTSD recommend trauma-focused CBT and eye-movement desensitization and reprocessing (EMDR) as the treatments of choice for trauma victims.[235,236] In women with PTSD following childbirth, a limited number of pilot studies have found promising results of both interventions.[237,238] There may be a role for pharmacological treatment in cases of severe PTSD (in particular with severe co-morbid depression), in the event of insufficient effects of psychological treatments or after refusal to engage in psychological treatments. However, the evidence for the efficacy of pharmacological treatments (mainly SSRIs) as compared to placebos in the reduction of PTSD symptoms is inconclusive.[235] Considering the possible consequences of PTSD following childbirth for the mother, infant, the partner and future pregnancies, further research into treatment options is of vital importance.

CONCLUSION

While psychiatric disorders may be present in women independent of their reproductive status, a number of disorders and conditions seem to be connected to the peripartum period. As summarized in table 1, these include several mood and anxiety related conditions. These psychiatric conditions carry the potential to have a serious negative impact not only on maternal well-being but also on the mother-child bonding and infant development. Treatment options include a variety of psychotherapeutic and pharmacological interventions, depending on the disorder, severity, potential risk to the fetus or neonate, co-morbidity and individual circumstances.

Maternity blues is the most common state of impaired mental well-being, affecting 15-85% of women during the first days postpartum. Tearfulness, feelings of sadness, anxiety, unstable moods, sorrow/weeping, and confusion are its most characteristic features. Due to the fact that it is generally a transient and self-limiting condition, it is not classified as a psychiatric *disorder*.

Major depressive disorder is characterized by depressed mood and diminished interest or pleasure in activities that were previously enjoyed. Various large studies suggest that the prevalence of MDD is quite similar among pregnant and non-pregnant women (7-13%), whereas there may be an increased risk of MDD with an onset during the postpartum period.

Bipolar disorder is a mood disorder characterized by depressive episodes in conjunction with manic episodes that has a lifetime prevalence of 1-2%. It has a much lower incidence than major depressive disorder, but is clinically relevant during the peripartum period since women with bipolar disorder have a high risk of developing a puerperal psychosis.

Puerperal psychosis is a medical emergency that requires hospitalization in most cases. It is rare (1-2 in 1000 women), but quite common among women with a bipolar disorder or a family history of puerperal psychosis and/or bipolar disorder.

Obsessive compulsive disorder often manifests as a preoccupation with contamination and intrusive thoughts about the infant being harmed (obsessions), with subsequent repetitive washing/cleaning behavior and checking or avoidant behavior (compulsions).

Fear of childbirth may be so severe that women meet the DSM-IV criteria for specific phobia. Approximately 7.5 percent of women report clinically significant fear of childbirth. Cesarean section on maternal request is common, some women even decide to terminate pregnancy, and some avoid becoming pregnant at all.

Posttraumatic stress disorder may occur when labor and delivery have been experienced as traumatic, and women suffer from symptoms of re-experiencing (e.g. nightmares, flashbacks),

avoidance, emotional numbing and hyperarousal. It occurs in 1-2 percent of women following childbirth.

Obstetric care professionals do not always recognize symptoms of these conditions in their patients. This is at least partially due to considerable overlap with normal (physiological) pregnancy and postpartum-related physical inconveniences, as well as reluctance among women to acknowledge that they do not feel elated about their pregnancy or newborn. Furthermore, obstetric care professionals may not explicitly ask for symptoms of mental disorders, because they are lacking knowledge, time, effective screening instruments, affinity with psychopathology, referral options or a combination of these. Mental health workers often have insufficient experience with the characteristic features of common mental disorders in the peripartum period, and the challenges that pharmacological treatment during pregnancy and lactation poses. Awareness, recognition and prompt referral are key to early intervention and prevention of long-term impairment of maternal well-being and adverse effects on mother-child bonding and infant development. Future research warrants evaluation of effective interventions and prevention strategies, as these are insufficiently studied for many of the conditions discussed in this particular, vulnerable population.

REFERENCES

1. Gavin NI, Gaynes BN, Lohr KN, Meltzer-Brody S, Gartlehner G, Swinson T. Perinatal depression: a systematic review of prevalence and incidence. Obstet Gynecol 2005;106(5):1071-83.
2. Bennett HA, Einarson A, Taddio A, Koren G, Einarson TR. Prevalence of depression during pregnancy: systematic review. Obstet Gynecol 2004;103(4):698-709.
3. Vesga-Lopez O, Blanco C, Keyes K, Olfson M, Grant BF, Hasin DS. Psychiatric disorders in pregnant and postpartum women in the United States. Arch Gen Psychiatry 2008;65(7):805-15.
4. Adams S, Eberhard-Gran M, Eskild A. Fear of childbirth and duration of labour: a study of 2206 women with intended vaginal delivery. BJOG 2012;119(10):1238-46.
5. Rouhe H, Salmela-Aro K, Halmesmaki E, Saisto T. Fear of childbirth according to parity, gestational age, and obstetric history. BJOG 2009;116(1):67-73.
6. Ayers S, Joseph S, Kenzie-McHarg K, Slade P, Wijma K. Post-traumatic stress disorder following childbirth: current issues and recommendations for future research. J Psychosom Obstet Gynaecol 2008;29(4):240-50.
7. Beck CT. Post-traumatic stress disorder due to childbirth: the aftermath. Nurs Res 2004;53(4):216-24.
8. Lovejoy MC, Graczyk PA, O'Hare E, Neuman G. Maternal depression and parenting behavior: a meta-analytic review. Clin Psychol Rev 2000;20(5):561-92.
9. Cantwell R, Clutton-Brock T, Cooper G, Dawson A, Drife J, Garrod D, Harper A, Hulbert D, Lucas S, McClure J, Millward-Sadler H, Neilson J, Nelson-Piercy C, Norman J, O'Herlihy C, Oates M, Shakespeare J, de Swiet M, Williamson C, Beale V, Knight M, Lennox C, Miller A, Parmar D, Rogers J, Springett A. Saving Mothers' Lives: Reviewing maternal deaths to make motherhood safer: 2006-2008. The Eighth Report of the Confidential Enquiries into Maternal Deaths in the United Kingdom. BJOG 2011;118 Suppl 1:1-203.
10. Schutte JM, Hink E, Heres MH, Wennink HJ, Honig A. Maternal mortality due to psychiatric disorders in the Netherlands. J Psychosom Obstet Gynaecol 2008;29(3):150-2.
11. Austin MP, Kildea S, Sullivan E. Maternal mortality and psychiatric morbidity in the perinatal period: challenges and opportunities for prevention in the Australian setting. Med J Aust 2007;186(7):364-7.
12. Brockington I. Postpartum psychiatric disorders. Lancet 2004;363(9405):303-10.
13. de Waal J, Tuerlings JH, de Boer K, Smal JC, van Waarde JA. [Recognition of psychiatrically vulnerable pregnant women]. Ned Tijdschr Geneeskd 2010;154(47):A2344.
14. Le Strat Y, Dubertret C, Le Foll B. Prevalence and correlates of major depressive episode in pregnant and postpartum women in the United States. J Affect Disord 2011;135(1-3):128-38.
15. American Psychiatric Association. Diagnostic and statistical manual of mental disorders, 4th edition (DSM-IV). 4th ed. Washington, DC: APA; 1994.
16. Chaudron LH, Pies RW. The relationship between postpartum psychosis and bipolar disorder: a review. J Clin Psychiatry 2003;64(11):1284-92.
17. Jones I, Craddock N. Familiality of the puerperal trigger in bipolar disorder: results of a family study. Am J Psychiatry 2001;158(6):913-7.
18. Rapaport MH, Judd LL, Schettler PJ, Yonkers KA, Thase ME, Kupfer DJ, Frank E, Plewes JM, Tollefson GD, Rush AJ. A descriptive analysis of minor depression. Am J Psychiatry 2002;159(4):637-43.

19. 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):2582-9.
20. Cooper C, Jones L, Dunn E, Forty L, Haque S, Oyebode F, Craddock N, Jones I. Clinical presentation of postnatal and non-postnatal depressive episodes. Psychol Med 2007;37(9):1273-80.
21. Matthey S, Ross-Hamid C. The validity of DSM symptoms for depression and anxiety disorders during pregnancy. J Affect Disord 2011;133(3):546-52.
22. Wisner KL, Moses-Kolko EL, Sit DK. Postpartum depression: a disorder in search of a definition. Arch Womens Ment Health 2010;13(1):37-40.
23. Condon J. Women's mental health: a "wish-list" for the DSM V. Arch Womens Ment Health 2010;13(1):5-10.
24. Kammerer M, Marks MN, Pinard C, Taylor A, von Castelberg B, Kunzli H, Glover V. Symptoms associated with the DSM IV diagnosis of depression in pregnancy and post partum. Arch Womens Ment Health 2009;12(3):135-41.
25. Jolley SN, Betrus P. Comparing postpartum depression and major depressive disorder: issues in assessment. Issues Ment Health Nurs 2007;28(7):765-80.
26. First MB, Spitzer RI, Gibbon M, Williams JB. Structured Clinical Interview for DSM-IV Axis I Disorders, Research version, Non-patient Edition (SCID-I/NP). 1997. New York, Biometrics Research Department, New York State Psychiatric Institute.
27. Sheehan DV, Lecrubier Y, Sheehan KH, Amorim P, Janavs J, Weiller E, Hergueta T, Baker R, Dunbar GC. The Mini-International Neuropsychiatric Interview (M.I.N.I.): the development and validation of a structured diagnostic psychiatric interview for DSM-IV and ICD-10. J Clin Psychiatry 1998;59 Suppl 20:22-33.
28. Kessler RC, Ustun TB. The World Mental Health (WMH) Survey Initiative Version of the World Health Organization (WHO) Composite International Diagnostic Interview (CIDI). Int J Methods Psychiatr Res 2004;13(2):93-121.
29. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. Br J Psychiatry 1987;150:782-6.
30. Beck AT, Steer RA, Brown GK. Beck Depression Inventory Manual. San Antonio (TX), USA: The Psychological corporation; 1996.
31. Zigmond AS, Snaith RP. The hospital anxiety and depression scale. Acta Psychiatr Scand 1983;67(6):361-70.
32. Bergink V, Kooistra L, Lambregtse-van den Berg MP, Wijnen H, Bunevicius R, van Baar A, Pop V. Validation of the Edinburgh Depression Scale during pregnancy. J Psychosom Res 2011;70(4):385-9.
33. Matthey S, Barnett B, Kavanagh DJ, Howie P. Validation of the Edinburgh Postnatal Depression Scale for men, and comparison of item endorsement with their partners. J Affect Disord 2001;64(2-3):175-84.
34. Felice E, Saliba J, Grech V, Cox J. Validation of the Maltese version of the Edinburgh Postnatal Depression Scale. Arch Womens Ment Health 2006;9(2):75-80.
35. Murray D, Cox J. Screening for depression during pregnancy with the Edinburgh Depression Scale (EPDS). J Reprod Infant Psychol 1990;8:99-107.

36. Bjelland I, Dahl AA, Haug TT, Neckelmann D. The validity of the Hospital Anxiety and Depression Scale. An updated literature review. J Psychosom Res 2002;52(2):69-77.
37. Kelly R, Zatzick D, Anders T. The detection and treatment of psychiatric disorders and substance use among pregnant women cared for in obstetrics. Am J Psychiatry 2001;158(2):213-9.
38. Chadha-Hooks PL, Hui PJ, Hilty DM, Seritan AL. Postpartum depression: an original survey of screening practices within a healthcare system. J Psychosom Obstet Gynaecol 2010;31(3):199-205.
39. Seedat S, Scott KM, Angermeyer MC, Berglund P, Bromet EJ, Brugha TS, Demyttenaere K, de Girolamo G, Haro JM, Jin R, Karam EG, Kovess-Masfety V, Levinson D, Medina Mora ME, Ono Y, Ormel J, Pennell BE, Posada-Villa J, Sampson NA, Williams D, Kessler RC. Cross-national associations between gender and mental disorders in the World Health Organization World Mental Health Surveys. Arch Gen Psychiatry 2009;66(7):785-95.
40. Wisner KL, Gelenberg AJ, Leonard H, Zarin D, Frank E. Pharmacologic treatment of depression during pregnancy. JAMA 1999;282(13):1264-9.
41. Robert E. Treatment depression in pregnancy. N Engl J Med 1996;335(14):1056-8.
42. O'Hara MW. Postpartum depression: Causes and consequences. New York, NY: Springer-Verlag; 1994.
43. Alonso J, Lepine JP. Overview of key data from the European Study of the Epidemiology of Mental Disorders (ESEMeD). J Clin Psychiatry 2007;68 Suppl 2:3-9.
44. Hasin DS, Goodwin RD, Stinson FS, Grant BF. Epidemiology of major depressive disorder: results from the National Epidemiologic Survey on Alcoholism and Related Conditions. Arch Gen Psychiatry 2005;62(10):1097-106.
45. Kessler RC, Berglund P, Demler O, Jin R, Koretz D, Merikangas KR, Rush AJ, Walters EE, Wang PS. The epidemiology of major depressive disorder: results from the National Comorbidity Survey Replication (NCS-R). JAMA 2003;289(23):3095-105.
46. Pop VJ, de Rooy HA, Vader HL, van der Heide D, van Son M, Komproe IH, Essed GG, de Geus CA. Postpartum thyroid dysfunction and depression in an unselected population. N Engl J Med 1991;324(25):1815-6.
47. Kuijpens JL, Vader HL, Drexhage HA, Wiersinga WM, van Son MJ, Pop VJ. Thyroid peroxidase antibodies during gestation are a marker for subsequent depression postpartum. Eur J Endocrinol 2001;145(5):579-84.
48. McCoy SJ, Beal JM, Payton ME, Stewart AL, DeMers AM, Watson GH. Postpartum thyroid measures and depressive symptomology: a pilot study. J Am Osteopath Assoc 2008;108(9):503-7.
49. Pedersen CA, Johnson JL, Silva S, Bunevicius R, Meltzer-Brody S, Hamer RM, Leserman J. Antenatal thyroid correlates of postpartum depression. Psychoneuroendocrinology 2007;32(3):235-45.
50. Lambrinoudaki I, Rizos D, Armeni E, Pliatsika P, Leonardou A, Sygelou A, Argeitis J, Spentzou G, Hasiakos D, Zervas I, Papadias C. Thyroid function and postpartum mood disturbances in Greek women. J Affect Disord 2010;121(3):278-82.
51. Albacar G, Sans T, Martin-Santos R, Garcia-Esteve L, Guillamat R, Sanjuan J, Canellas F, Carot JM, Gratacos M, Bosch J, Gaviria A, Labad A, Zotes AG, Vilella E. Thyroid function 48h after delivery as a marker for subsequent postpartum depression. Psychoneuroendocrinology 2010;35(5):738-42.
52. Basraon S, Costantine MM. Mood disorders in pregnant women with thyroid dysfunction. Clin Obstet Gynecol 2011;54(3):506-14.

53. Bloch M, Daly RC, Rubinow DR. Endocrine factors in the etiology of postpartum depression. Compr Psychiatry 2003;44(3):234-46.

54. Bloch M, Schmidt PJ, Danaceau M, Murphy J, Nieman L, Rubinow DR. Effects of gonadal steroids in women with a history of postpartum depression. Am J Psychiatry 2000;157(6):924-30.

55. Cassidy-Bushrow AE, Peters RM, Johnson DA, Li J, Rao DS. Vitamin d nutritional status and antenatal depressive symptoms in african american women. J Womens Health (Larchmt) 2012;21(11):1189-95.

56. O'Hara MW. Depression during pregnancy: diagnosis and treatment options. In: Postpartum depression: Causes and consequences. New York: Springer-Verlag; 1994. p. 110-20.

57. Nielsen FD, Videbech P, Hedegaard M, Dalby SJ, Secher NJ. Postpartum depression: identification of women at risk. BJOG 2000;107(10):1210-7.

58. Zuckerman B, Amaro H, Bauchner H, Cabral H. Depressive symptoms during pregnancy: relationship to poor health behaviors. Am J Obstet Gynecol 1989;160(5 Pt 1):1107-11.

59. Kurki T, Hiilesmaa V, Raitasalo R, Mattila H, Ylikorkala O. Depression and anxiety in early pregnancy and risk for preeclampsia. Obstet Gynecol 2000;95(4):487-90.

60. Burt VK, Stein K. Epidemiology of depression throughout the female life cycle. J Clin Psychiatry 2002;63 Suppl 7:9-15.

61. Chaudron LH, Klein MH, Remington P, Palta M, Allen C, Essex MJ. Predictors, prodromes and incidence of postpartum depression. J Psychosom Obstet Gynaecol 2001;22(2):103-12.

62. Stowe ZN, Nemeroff CB. Women at risk for postpartum-onset major depression. Am J Obstet Gynecol 1995;173(2):639-45.

63. Grote NK, Bridge JA, Gavin AR, Melville JL, Iyengar S, Katon WJ. A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. Arch Gen Psychiatry 2010;67(10):1012-24.

64. Yonkers KA, Norwitz ER, Smith MV, Lockwood CJ, Gotman N, Luchansky E, Lin H, Belanger K. Depression and Serotonin Reuptake Inhibitor Treatment as Risk Factors for Preterm Birth. Epidemiology 2012;23(5):677-85.

65. El Marroun H, Jaddoe VW, Hudziak JJ, Roza SJ, Steegers EA, Hofman A, Verhulst FC, White TJ, Stricker BH, Tiemeier H. Maternal use of selective serotonin reuptake inhibitors, fetal growth, and risk of adverse birth outcomes. Arch Gen Psychiatry 2012;69(7):706-14.

66. McLearn KT, Minkovitz CS, Strobino DM, Marks E, Hou W. The timing of maternal depressive symptoms and mothers' parenting practices with young children: implications for pediatric practice. Pediatrics 2006;118(1):e174-e182.

67. Jennings KD, Ross S, Popper S, Elmore M. Thoughts of harming infants in depressed and nondepressed mothers. J Affect Disord 1999;54(1-2):21-8.

68. McLearn KT, Minkovitz CS, Strobino DM, Marks E, Hou W. Maternal depressive symptoms at 2 to 4 months post partum and early parenting practices. Arch Pediatr Adolesc Med 2006;160(3):279-84.

69. Paulson JF, Dauber S, Leiferman JA. Individual and combined effects of postpartum depression in mothers and fathers on parenting behavior. Pediatrics 2006;118(2):659-68.

70. Righetti-Veltema M, Conne-Perreard E, Bousquet A, Manzano J. Postpartum depression and mother-infant relationship at 3 months old. J Affect Disord 2002;70(3):291-306.

71. Dennis CL, Ross L. Relationships among infant sleep patterns, maternal fatigue, and development of depressive symptomatology. Birth 2005;32(3):187-93.
72. Minkovitz CS, Strobino D, Scharfstein D, Hou W, Miller T, Mistry KB, Swartz K. Maternal depressive symptoms and children's receipt of health care in the first 3 years of life. Pediatrics 2005;115(2):306-14.
73. Field T. Prenatal depression effects on early development: a review. Infant Behav Dev 2011;34(1):1-14.
74. Misri S, Reebye P, Kendrick K, Carter D, Ryan D, Grunau RE, Oberlander TF. Internalizing behaviors in 4-year-old children exposed in utero to psychotropic medications. Am J Psychiatry 2006;163(6):1026-32.
75. Carter AS, Garrity-Rokous FE, Chazan-Cohen R, Little C, Briggs-Gowan MJ. Maternal depression and comorbidity: predicting early parenting, attachment security, and toddler social-emotional problems and competencies. J Am Acad Child Adolesc Psychiatry 2001;40(1):18-26.
76. Sohr-Preston SL, Scaramella LV. Implications of timing of maternal depressive symptoms for early cognitive and language development. Clin Child Fam Psychol Rev 2006;9(1):65-83.
77. Kersten-Alvarez LE, Hosman CM, Riksen-Walraven JM, van Doesum KT, Smeekens S, Hoefnagels C. Early school outcomes for children of postpartum depressed mothers: comparison with a community sample. Child Psychiatry Hum Dev 2012;43(2):201-18.
78. Davalos DB, Yadon CA, Tregellas HC. Untreated prenatal maternal depression and the potential risks to offspring: a review. Arch Womens Ment Health 2012.
79. Gentile S. SSRIs in pregnancy and lactation: emphasis on neurodevelopmental outcome. CNS Drugs 2005;19(7):623-33.
80. Epperson N, Czarkowski KA, Ward-O'Brien D, Weiss E, Gueorguieva R, Jatlow P, Anderson GM. Maternal sertraline treatment and serotonin transport in breast-feeding mother-infant pairs. Am J Psychiatry 2001;158(10):1631-7.
81. Occhiogrosso M, Omran SS, Altemus M. Persistent pulmonary hypertension of the newborn and slective serotonin reuptake inhibitors: lessons from clinical and translational studies. Am J Psychiatry 2012;169(2):134-40.
82. Galbally M, Gentile S, Lewis AJ. Further Findings Linking SSRIs During Pregnancy and Persistent Pulmonary Hypertension of the Newborn: Clinical Implications. CNS Drugs 2012;26(10):813-22.
83. Kieler H, Artama M, Engeland A, Ericsson O, Furu K, Gissler M, Nielsen RB, Norgaard M, Stephansson O, Valdimarsdottir U, Zoega H, Haglund B. Selective serotonin reuptake inhibitors during pregnancy and risk of persistent pulmonary hypertension in the newborn: population based cohort study from the five Nordic countries. BMJ 2012;344:d8012.
84. Salisbury AL, Wisner KL, Pearlstein T, Battle CL, Stroud L, Lester BM. Newborn neurobehavioral patterns are differentially related to prenatal maternal major depressive disorder and serotonin reuptake inhibitor treatment. Depress Anxiety 2011;28(11):1008-19.
85. Gentile S, Galbally M. Prenatal exposure to antidepressant medications and neurodevelopmental outcomes: a systematic review. J Affect Disord 2011;128(1-2):1-9.
86. Croen LA, Grether JK, Yoshida CK, Odouli R, Hendrick V. Antidepressant use during pregnancy and childhood autism spectrum disorders. Arch Gen Psychiatry 2011;68(11):1104-12.

87. Nulman I, Koren G, Rovet J, Barrera M, Pulver A, Streiner D, Feldman B. Neurodevelopment of children following prenatal exposure to venlafaxine, selective serotonin reuptake inhibitors, or untreated maternal depression. Am J Psychiatry 2012;169(11):1165-74.

88. Pedersen LH, Henriksen TB, Bech BH, Licht RW, Kjaer D, Olsen J. Prenatal antidepressant exposure and behavioral problems in early childhood - a cohort study. Acta Psychiatr Scand 2012.

89. Ponder KL, Salisbury A, McGonnigal B, Laliberte A, Lester B, Padbury JF. Maternal depression and anxiety are associated with altered gene expression in the human placenta without modification by antidepressant use: implications for fetal programming. Dev Psychobiol 2011;53(7):711-23.

90. Jimenez-Solem E, Andersen JT, Petersen M, Broedbaek K, Jensen JK, Afzal S, Gislason GH, Torp-Pedersen C, Poulsen HE. Exposure to selective serotonin reuptake inhibitors and the risk of congenital malformations: a nationwide cohort study. BMJ Open 2012;2(3).

91. Nordeng H, van Gelder MM, Spigset O, Koren G, Einarson A, Eberhard-Gran M. Pregnancy outcome after exposure to antidepressants and the role of maternal depression: results from the Norwegian Mother and Child Cohort Study. J Clin Psychopharmacol 2012;32(2):186-94.

92. Yonkers KA, Gotman N, Smith MV, Forray A, Belanger K, Brunetto WL, Lin H, Burkman RT, Zelop CM, Lockwood CJ. Does antidepressant use attenuate the risk of a major depressive episode in pregnancy? Epidemiology 2011;22(6):848-54.

93. Cohen LS, Altshuler LL, Harlow BL, Nonacs R, Newport DJ, Viguera AC, Suri R, Burt VK, Hendrick V, Reminick AM, Loughead A, Vitonis AF, Stowe ZN. Relapse of major depression during pregnancy in women who maintain or discontinue antidepressant treatment. JAMA 2006;295(5):499-507.

94. Hegerl U, Schonknecht P, Mergl R. Are antidepressants useful in the treatment of minor depression: a critical update of the current literature. Curr Opin Psychiatry 2012;25(1):1-6.

95. Dennis CL, Ross LE, Grigoriadis S. Psychosocial and psychological interventions for treating antenatal depression. Cochrane Database Syst Rev 2007;(3):CD006309.

96. Duncan LG, Bardacke N. Mindfulness-Based Childbirth and Parenting Education: Promoting Family Mindfulness During the Perinatal Period. J Child Fam Stud 2010;19(2):190-202.

97. Dunn C, Hanieh E, Roberts R, Powrie R. Mindful pregnancy and childbirth: effects of a mindfulness-based intervention on women's psychological distress and well-being in the perinatal period. Arch Womens Ment Health 2012;15(2):139-43.

98. Dennis CL, Hodnett E. Psychosocial and psychological interventions for treating postpartum depression. Cochrane Database Syst Rev 2007;(4):CD006116.

99. Sockol LE, Epperson CN, Barber JP. A meta-analysis of treatments for perinatal depression. Clin Psychol Rev 2011;31(5):839-49.

100. Stuart S. Interpersonal psychotherapy: A guide to the basics. Psychiatric Annals 2006;36:542-9.

101. Kiesler DJ. Contemporary interpersonal theory and research: Personality, psychopathology, and psychotherapy. New York, NY: John Wiley & Sons; 1996.

102. Spinelli MG, Endicott J. Controlled clinical trial of interpersonal psychotherapy versus parenting education program for depressed pregnant women. Am J Psychiatry 2003;160(3):555-62.

103. Grote NK, Swartz HA, Geibel SL, Zuckoff A, Houck PR, Frank E. A randomized controlled trial of culturally relevant, brief interpersonal psychotherapy for perinatal depression. Psychiatr Serv 2009;60(3):313-21.

104. O'Hara MW, Stuart S, Gorman LL, Wenzel A. Efficacy of interpersonal psychotherapy for postpartum depression. Arch Gen Psychiatry 2000;57(11):1039-45.

105. Nylen KJ, O'Hara MW, Brock R, Moel J, Gorman L, Stuart S. Predictors of the longitudinal course of postpartum depression following interpersonal psychotherapy. J Consult Clin Psychol 2010;78(5):757-63.

106. Wojcicki JM, Heyman MB. Maternal omega-3 fatty acid supplementation and risk for perinatal maternal depression. J Matern Fetal Neonatal Med 2011;24(5):680-6.

107. Borja-Hart NL, Marino J. Role of omega-3 Fatty acids for prevention or treatment of perinatal depression. Pharmacotherapy 2010;30(2):210-6.

108. Kendall-Tackett K. Long-chain omega-3 fatty acids and women's mental health in the perinatal period and beyond. J Midwifery Womens Health 2010;55(6):561-7.

109. Jans LA, Giltay EJ, Van der Does AJ. The efficacy of n-3 fatty acids DHA and EPA (fish oil) for perinatal depression. Br J Nutr 2010;104(11):1577-85.

110. Golden RN, Gaynes BN, Ekstrom RD, Hamer RM, Jacobsen FM, Suppes T, Wisner KL, Nemeroff CB. The efficacy of light therapy in the treatment of mood disorders: a review and meta-analysis of the evidence. Am J Psychiatry 2005;162(4):656-62.

111. Tuunainen A, Kripke DF, Endo T. Light therapy for non-seasonal depression. Cochrane Database Syst Rev 2004;(2):CD004050.

112. Even C, Schroder CM, Friedman S, Rouillon F. Efficacy of light therapy in nonseasonal depression: a systematic review. J Affect Disord 2008;108(1-2):11-23.

113. Wirz-Justice A, Bader A, Frisch U, Stieglitz RD, Alder J, Bitzer J, Hosli I, Jazbec S, Benedetti F, Terman M, Wisner KL, Riecher-Rossler A. A randomized, double-blind, placebo-controlled study of light therapy for antepartum depression. J Clin Psychiatry 2011;72(7):986-93.

114. Dennis CL, Ross LE, Herxheimer A. Oestrogens and progestins for preventing and treating postpartum depression. Cochrane Database Syst Rev 2008;(4):CD001690.

115. Dennis CL, Allen K. Interventions (other than pharmacological, psychosocial or psychological) for treating antenatal depression. Cochrane Database Syst Rev 2008;(4):CD006795.

116. Zhang ZJ, Chen HY, Yip KC, Ng R, Wong VT. The effectiveness and safety of acupuncture therapy in depressive disorders: systematic review and meta-analysis. J Affect Disord 2010;124(1-2):9-21.

117. Manber R, Schnyer RN, Lyell D, Chambers AS, Caughey AB, Druzin M, Carlyle E, Celio C, Gress JL, Huang MI, Kalista T, Martin-Okada R, Allen JJ. Acupuncture for depression during pregnancy: a randomized controlled trial. Obstet Gynecol 2010;115(3):511-20.

118. Allen JJ, Schnyer RN, Chambers AS, Hitt SK, Moreno FA, Manber R. Acupuncture for depression: a randomized controlled trial. J Clin Psychiatry 2006;67(11):1665-73.

119. Anderson EL, Reti IM. ECT in pregnancy: a review of the literature from 1941 to 2007. Psychosom Med 2009;71(2):235-42.

120. Forray A, Ostroff RB. The use of electroconvulsive therapy in postpartum affective disorders. J ECT 2007;23(3):188-93.

121. Wisner KL, Perel JM, Peindl KS, Hanusa BH, Piontek CM, Findling RL. Prevention of postpartum depression: a pilot randomized clinical trial. Am J Psychiatry 2004;161(7):1290-2.

122. Wisner KL, Hanusa BH, Perel JM, Peindl KS, Piontek CM, Sit DK, Findling RL, Moses-Kolko EL. Postpartum depression: a randomized trial of sertraline versus nortriptyline. J Clin Psychopharmacol 2006;26(4):353-60.

123. Appleby L, Warner R, Whitton A, Faragher B. A controlled study of fluoxetine and cognitive-behavioural counselling in the treatment of postnatal depression. BMJ 1997;314(7085):932-6.

124. Dennis CL. Psychosocial and psychological interventions for prevention of postnatal depression: systematic review. BMJ 2005;331(7507):15.

125. Merikangas KR, Jin R, He JP, Kessler RC, Lee S, Sampson NA, Viana MC, Andrade LH, Hu C, Karam EG, Ladea M, Medina-Mora ME, Ono Y, Posada-Villa J, Sagar R, Wells JE, Zarkov Z. Prevalence and correlates of bipolar spectrum disorder in the world mental health survey initiative. Arch Gen Psychiatry 2011;68(3):241-51.

126. Merikangas KR, Akiskal HS, Angst J, Greenberg PE, Hirschfeld RM, Petukhova M, Kessler RC. Lifetime and 12-month prevalence of bipolar spectrum disorder in the National Comorbidity Survey replication. Arch Gen Psychiatry 2007;64(5):543-52.

127. Bergink V, Bouvy PF, Vervoort JS, Koorengevel KM, Steegers EA, Kushner SA. Prevention of postpartum psychosis and mania in women at high risk. Am J Psychiatry 2012;169(6):609-15.

128. Brockington IF. Motherhood and Mental Health. Oxford, UK: Oxford University Press; 1996.

129. Pariser SF. Women and mood disorders. Menarche to menopause. Ann Clin Psychiatry 1993;5(4):249-54.

130. Boden R, Lundgren M, Brandt L, Reutfors J, Andersen M, Kieler H. Risks of adverse pregnancy and birth outcomes in women treated or not treated with mood stabilisers for bipolar disorder: population based cohort study. BMJ 2012;345:e7085.

131. Viguera AC, Whitfield T, Baldessarini RJ, Newport DJ, Stowe Z, Reminick A, Zurick A, Cohen LS. Risk of recurrence in women with bipolar disorder during pregnancy: prospective study of mood stabilizer discontinuation. Am J Psychiatry 2007;164(12):1817-24.

132. Malhi GS, Bargh DM, McIntyre R, Gitlin M, Frye MA, Bauer M, Berk M. Balanced efficacy, safety, and tolerability recommendations for the clinical management of bipolar disorder. Bipolar Disord 2012;14 Suppl 2:1-21.

133. Lee HC, Lin HC. Maternal bipolar disorder increased low birthweight and preterm births: a nationwide population-based study. J Affect Disord 2010;121(1-2):100-5.

134. Yacobi S, Ornoy A. Is lithium a real teratogen? What can we conclude from the prospective versus retrospective studies? A review. Isr J Psychiatry Relat Sci 2008;45(2):95-106.

135. Cohen LS, Friedman JM, Jefferson JW, Johnson EM, Weiner ML. A reevaluation of risk of in utero exposure to lithium. JAMA 1994;271(2):146-50.

136. Pinelli JM, Symington AJ, Cunningham KA, Paes BA. Case report and review of the perinatal implications of maternal lithium use. Am J Obstet Gynecol 2002;187(1):245-9.

137. McKnight RF, Adida M, Budge K, Stockton S, Goodwin GM, Geddes JR. Lithium toxicity profile: a systematic review and meta-analysis. Lancet 2012;379(9817):721-8.

138. Newport DJ, Viguera AC, Beach AJ, Ritchie JC, Cohen LS, Stowe ZN. Lithium placental passage and obstetrical outcome: implications for clinical management during late pregnancy. Am J Psychiatry 2005;162(11):2162-70.

139. Jentink J, Dolk H, Loane MA, Morris JK, Wellesley D, Garne E, de Jong-van den Berg. Intrauterine exposure to carbamazepine and specific congenital malformations: systematic review and case-control study. BMJ 2010;341:c6581.

140. Jentink J, Loane MA, Dolk H, Barisic I, Garne E, Morris JK, de Jong-van den Berg LT. Valproic acid monotherapy in pregnancy and major congenital malformations. N Engl J Med 2010;362(23):2185-93.

141. Boden R, Lundgren M, Brandt L, Reutfors J, Kieler H. Antipsychotics during pregnancy: relation to fetal and maternal metabolic effects. Arch Gen Psychiatry 2012;69(7):715-21.

142. Gentile S. Prophylactic treatment of bipolar disorder in pregnancy and breastfeeding: focus on emerging mood stabilizers. Bipolar Disord 2006;8(3):207-20.

143. Banach R, Boskovic R, Einarson T, Koren G. Long-term developmental outcome of children of women with epilepsy, unexposed or exposed prenatally to antiepileptic drugs: a meta-analysis of cohort studies. Drug Saf 2010;33(1):73-9.

144. Meador KJ, Baker GA, Browning N, Cohen MJ, Bromley RL, Clayton-Smith J, Kalayjian LA, Kanner A, Liporace JD, Pennell PB, Privitera M, Loring DW. Effects of fetal antiepileptic drug exposure: outcomes at age 4.5 years. Neurology 2012;78(16):1207-14.

145. Bromley RL, Baker GA, Meador KJ. Cognitive abilities and behaviour of children exposed to antiepileptic drugs in utero. Curr Opin Neurol 2009;22(2):162-6.

146. Gentile S. Antipsychotic therapy during early and late pregnancy. A systematic review. Schizophr Bull 2010;36(3):518-44.

147. Johnson KC, Laprairie JL, Brennan PA, Stowe ZN, Newport DJ. Prenatal Antipsychotic Exposure and Neuromotor Performance During Infancy. Arch Gen Psychiatry 2012.

148. van der Lugt NM, van de Maat JS, van Kamp I, Knoppert-van der Klein EA, Hovens JG, Walther FJ. Fetal, neonatal and developmental outcomes of lithium-exposed pregnancies. Early Hum Dev 2012;88(6):375-8.

149. van den Berg B, Knoppert-van der Klein EA, van Zaane J. [Psychotherapeutic treatment options for bipolar disorders. A review of randomized controlled studies]. Tijdschr Psychiatr 2006;48(12):905-13.

150. Klompenhouwer J, van Hulst A, Tulen J, Jacobs M, Jacobs B, Segers F. The clinical features of postpartum psychoses. Eur Psychiatry 1995;10(7):355-67.

151. Bergink V, Lambregtse-van den Berg MP, Koorengevel KM, Kupka R, Kushner SA. First-onset psychosis occurring in the postpartum period: a prospective cohort study. J Clin Psychiatry 2011;72(11):1531-7.

152. Bergink V, Kushner SA, Pop V, Kuijpens H, Lambregtse-van den Berg MP, Drexhage RC, Wiersinga W, Nolen WA, Drexhage HA. Prevalence of autoimmune thyroid dysfunction in postpartum psychosis. Br J Psychiatry 2011;198(4):264-8.

153. Kendell RE, Chalmers JC, Platz C. Epidemiology of puerperal psychoses. Br J Psychiatry 1987;150:662-73.

154. Terp IM, Mortensen PB. Post-partum psychoses. Clinical diagnoses and relative risk of admission after parturition. Br J Psychiatry 1998;172:521-6.

155. Klompenhouwer JL, van Hulst AM. Classification of postpartum psychosis: a study of 250 mother and baby admissions in The Netherlands. Acta Psychiatr Scand 1991;84(3):255-61.

156. Rhode A, Marneros A. Postpartum psychoses: onset and long-term course. Psychopathology 1993;26(3-4):203-9.

157. Doucet S, Jones I, Letourneau N, Dennis CL, Blackmore ER. Interventions for the prevention and treatment of postpartum psychosis: a systematic review. Arch Womens Ment Health 2011;14(2):89-98.

158. Reed P, Sermin N, Appleby L, Faragher B. A comparison of clinical response to electroconvulsive therapy in puerperal and non-puerperal psychoses. J Affect Disord 1999;54(3):255-60.

159. Sharma V. Pharmacotherapy of postpartum psychosis. Expert Opin Pharmacother 2003;4(10):1651-8.

160. Robertson E, Jones I, Haque S, Holder R, Craddock N. Risk of puerperal and non-puerperal recurrence of illness following bipolar affective puerperal (post-partum) psychosis. Br J Psychiatry 2005;186:258-9.

161. Stewart DE, Klompenhouwer JL, Kendell RE, van Hulst AM. Prophylactic lithium in puerperal psychosis. The experience of three centres. Br J Psychiatry 1991;158:393-7.

162. Henshaw C. Mood disturbance in the early puerperium: a review. Arch Womens Ment Health 2003;6 Suppl 2:S33-S42.

163. Newport DJ, Hostetter A, Arnold A, Stowe ZN. The treatment of postpartum depression: minimizing infant exposures. J Clin Psychiatry 2002;63 Suppl 7:31-44.

164. Gonidakis F, Rabavilas AD, Varsou E, Kreatsas G, Christodoulou GN. Maternity blues in Athens, Greece: a study during the first 3 days after delivery. J Affect Disord 2007;99(1-3):107-15.

165. Harris B, Lovett L, Newcombe RG, Read GF, Walker R, Riad-Fahmy D. Maternity blues and major endocrine changes: Cardiff puerperal mood and hormone study II. BMJ 1994;308(6934):949-53.

166. Reck C, Stehle E, Reinig K, Mundt C. Maternity blues as a predictor of DSM-IV depression and anxiety disorders in the first three months postpartum. J Affect Disord 2009;113(1-2):77-87.

167. Wenzel A. Anxiety in childbearing women: diagnosis and treatment. Washington, DC: American Psychological Association; 2011.

168. Alder J, Fink N, Bitzer J, Hosli I, Holzgreve W. Depression and anxiety during pregnancy: a risk factor for obstetric, fetal and neonatal outcome? A critical review of the literature. J Matern Fetal Neonatal Med 2007;20(3):189-209.

169. Huizink AC, Mulder EJ, Robles de Medina PG, Visser GH, Buitelaar JK. Is pregnancy anxiety a distinctive syndrome? Early Hum Dev 2004;79(2):81-91.

170. Uguz F, Gezginc K, Zeytinci IE, Karatayli S, Askin R, Guler O, Kir SF, Emul HM, Ozbulut O, Gecici O. Obsessive-compulsive disorder in pregnant women during the third trimester of pregnancy. Compr Psychiatry 2007;48(5):441-5.

171. Abramowitz JS, Schwartz SA, Moore KM, Luenzmann KR. Obsessive-compulsive symptoms in pregnancy and the puerperium: a review of the literature. J Anxiety Disord 2003;17(4):461-78.

172. Uguz F, Akman C, Kaya N, Cilli AS. Postpartum-onset obsessive-compulsive disorder: incidence, clinical features, and related factors. J Clin Psychiatry 2007;68(1):132-8.

173. Fairbrother N, Abramowitz JS. New parenthood as a risk factor for the development of obsessional problems. Behav Res Ther 2007;45(9):2155-63.

174. Rasmussen SA, Eisen JL. The epidemiology and differential diagnosis of obsessive compulsive disorder. J Clin Psychiatry 1994;55 Suppl:5-10.

175. Williams KE, Koran LM. Obsessive-compulsive disorder in pregnancy, the puerperium, and the premenstruum. J Clin Psychiatry 1997;58(7):330-4.

176. Kessler RC, Berglund P, Demler O, Jin R, Merikangas KR, Walters EE. Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the National Comorbidity Survey Replication. Arch Gen Psychiatry 2005;62(6):593-602.

177. Zambaldi CF, Cantilino A, Montenegro AC, Paes JA, de Albuquerque TL, Sougey EB. Postpartum obsessive-compulsive disorder: prevalence and clinical characteristics. Compr Psychiatry 2009;50(6):503-9.

178. Labad J, Menchon JM, Alonso P, Segalas C, Jimenez S, Vallejo J. Female reproductive cycle and obsessive-compulsive disorder. J Clin Psychiatry 2005;66(4):428-35.

179. Forray A, Focseneanu M, Pittman B, McDougle CJ, Epperson CN. Onset and exacerbation of obsessive-compulsive disorder in pregnancy and the postpartum period. J Clin Psychiatry 2010;71(8):1061-8.

180. Neziroglu F, Anemone R, Yaryura-Tobias JA. Onset of obsessive-compulsive disorder in pregnancy. Am J Psychiatry 1992;149(7):947-50.

181. Buttolph ML, Holland AD. Obsessive-compulsive disorders in pregnancy and childbirth. In: Jenike M, Baer L, Minichiello W, editors. Obsessive-compulsive disorders: theory and management. Chicago: Year Book Medical; 1990. p. 89-97.

182. Barr LC, Goodman WK, Price LH. The serotonin hypothesis of obsessive compulsive disorder. Int Clin Psychopharmacol 1993;8 Suppl 2:79-82.

183. Leckman JF, Goodman WK, North WG, Chappell PB, Price LH, Pauls DL, Anderson GM, Riddle MA, McDougle CJ, Barr LC, . The role of central oxytocin in obsessive compulsive disorder and related normal behavior. Psychoneuroendocrinology 1994;19(8):723-49.

184. Abramowitz JS. Effectiveness of psychological and pharmacological treatments for obsessive-compulsive disorder: a quantitative review. J Consult Clin Psychol 1997;65(1):44-52.

185. Foa EB, Liebowitz MR, Kozak MJ, Davies S, Campeas R, Franklin ME, Huppert JD, Kjernisted K, Rowan V, Schmidt AB, Simpson HB, Tu X. Randomized, placebo-controlled trial of exposure and ritual prevention, clomipramine, and their combination in the treatment of obsessive-compulsive disorder. Am J Psychiatry 2005;162(1):151-61.

186. Wijma, K. Workshop Fear of Childbirth. ISPOG conference, Venice (Italy), October 2010. 2010. Ref Type: Conference Proceeding

187. Laursen M, Hedegaard M, Johansen C. Fear of childbirth: predictors and temporal changes among nulliparous women in the Danish National Birth Cohort. BJOG 2008;115(3):354-60.

188. Saisto T, Halmesmaki E. Fear of childbirth: a neglected dilemma. Acta Obstet Gynecol Scand 2003;82(3):201-8.

189. Wijma K, Wijma B, Zar M. Psychometric aspects of the W-DEQ; a new questionnaire for the measurement of fear of childbirth. J Psychosom Obstet Gynaecol 1998;19(2):84-97.

190. Garthus-Niegel S, Storksen HT, Torgersen L, Von Soest T, Eberhard-Gran M. The Wijma Delivery Expectancy/Experience Questionnaire: a factor analytic study. J Psychosom Obstet Gynaecol 2011;32(3):160-3.

191. Soderquist J, Wijma B, Thorbert G, Wijma K. Risk factors in pregnancy for post-traumatic stress and depression after childbirth. BJOG 2009;116(5):672-80.

192. aursen M, Johansen C, Hedegaard M. Fear of childbirth and risk for birth complications in nulliparous women in the Danish National Birth Cohort. BJOG 2009;116(10):1350-5.

193. Ryding EL, Wijma B, Wijma K, Rydhstrom H. Fear of childbirth during pregnancy may increase the risk of emergency cesarean section. Acta Obstet Gynecol Scand 1998;77(5):542-7.

194. Saisto T, Salmela-Aro K, Nurmi JE, Kononen T, Halmesmaki E. A randomized controlled trial of intervention in fear of childbirth. Obstet Gynecol 2001;98(5 Pt 1):820-6.

195. Saisto T, Toivanen R, Salmela-Aro K, Halmesmaki E. Therapeutic group psychoeducation and relaxation in treating fear of childbirth. Acta Obstet Gynecol Scand 2006;85(11):1315-9.

196. Brady KT, Killeen TK, Brewerton T, Lucerini S. Comorbidity of psychiatric disorders and posttraumatic stress disorder. J Clin Psychiatry 2000;61(Suppl 7):22-32.

197. Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 1995;52(12):1048-60.

198. White T, Matthey S, Boyd K, Barnett B. Postnatal depression and post-traumatic stress after childbirth: Prevalence, course and co-occurrence. J Reprod Infant Psychol 2006;24(2):107-20.

199. Alcorn KL, O'Donovan A, Patrick JC, Creedy D, Devilly GJ. A prospective longitudinal study of the prevalence of post-traumatic stress disorder resulting from childbirth events. Psychol Med 2010;1-11.

200. Wijma K, Soderquist J, Wijma B. Posttraumatic stress disorder after childbirth: a cross sectional study. J Anxiety Disord 1997;11(6):587-97.

201. Foa EB, Riggs DS, Dancu CV, Rothbaum BO. Reliability and Validity of a Brief Instrument for Assessing Post-Traumatic Stress Disorder. J Trauma Stress 1993;4:459-73.

202. Davidson JR, Book SW, Colket JT, Tupler LA, Roth S, David D, Hertzberg M, Mellman T, Beckham JC, Smith RD, Davison RM, Katz R, Feldman ME. Assessment of a new self-rating scale for post-traumatic stress disorder. Psychol Med 1997;27(1):153-60.

203. Watson CG, Juba MP, Manifold V, Kucala T, Anderson PE. The PTSD interview: rationale, description, reliability, and concurrent validity of a DSM-III-based technique. J Clin Psychol 1991;47(2):179-88.

204. Horowitz M, Wilner N, Alvarez W. Impact of Event Scale: a measure of subjective stress. Psychosom Med 1979;41(3):209-18.

205. Goldberg DP, Hillier VF. A scaled version of the General Health Questionnaire. Psychol Med 1979;9(1):139-45.

206. Ayers S, Pickering AD. Do women get posttraumatic stress disorder as a result of childbirth? A prospective study of incidence. Birth 2001;28(2):111-8.

207. Soderquist J, Wijma K, Wijma B. Traumatic stress after childbirth: the role of obstetric variables. J Psychosom Obstet Gynaecol 2002;23(1):31-9.

208. Olde E, van der HO, Kleber RJ, van Son MJ, Wijnen HA, Pop VJ. Peritraumatic dissociation and emotions as predictors of PTSD symptoms following childbirth. J Trauma Dissociation 2005;6(3):125-42.

209. Creedy DK, Shochet IM, Horsfall J. Childbirth and the development of acute trauma symptoms: incidence and contributing factors. Birth 2000;27(2):104-11.

210. Zaers S, Waschke M, Ehlert U. Depressive symptoms and symptoms of post-traumatic stress disorder in women after childbirth. J Psychosom Obstet Gynaecol 2008;29(1):61-71.

211. Soderquist J, Wijma B, Wijma K. The longitudinal course of post-traumatic stress after childbirth. J Psychosom Obstet Gynaecol 2006;27(2):113-9.

212. Maggioni C, Margola D, Filippi F. PTSD, risk factors, and expectations among women having a baby: a two-wave longitudinal study. J Psychosom Obstet Gynaecol 2006;27(2):81-90.

213. Czarnocka J, Slade P. Prevalence and predictors of post-traumatic stress symptoms following childbirth. Br J Clin Psychol 2000;39 (Pt 1):35-51.

214. at eight weeks postpartum. J Anxiety Disord 2005;19(3):295-311.

215. Adewuya AO, Ologun YA, Ibigbami OS. Post-traumatic stress disorder after childbirth in Nigerian women: prevalence and risk factors. BJOG 2006;113(3):284-8.

216. Cohen MM, Ansara D, Schei B, Stuckless N, Stewart DE. Posttraumatic stress disorder after pregnancy, labor, and delivery. J Womens Health (Larchmt) 2004;13(3):315-24.

217. Lev-Wiesel R, Daphna-Tekoah S, Hallak M. Childhood sexual abuse as a predictor of birth-related posttraumatic stress and postpartum posttraumatic stress. Child Abuse Negl 2009;33(12):877-87.

218. Lev-Wiesel R, Daphna-Tekoah S. The role of peripartum dissociation as a predictor of posttraumatic stress symptoms following childbirth in Israeli Jewish women. J Trauma Dissociation 2010;11(3):266-83.

219. Green BL, Lindy JD, Grace MC. Posttraumatic stress disorder. Toward DSM-IV. J Nerv Ment Dis 1985;173(7):406-11.

220. Ryding EL, Wijma K, Wijma B. Psychological impact of emergency cesarean section in comparison with elective cesarean section, instrumental and normal vaginal delivery. J Psychosom Obstet Gynaecol 1998;19(3):135-44.

221. Pierrehumbert B, Nicole A, Muller-Nix C, Forcada-Guex M, Ansermet F. Parental post-traumatic reactions after premature birth: implications for sleeping and eating problems in the infant. Arch Dis Child Fetal Neonatal Ed 2003;88(5):F400-F404.

222. Engelhard IM, van Rij M, Boullart I, Ekhart TH, Spaanderman ME, van den Hout MA, Peeters LL. Posttraumatic stress disorder after pre-eclampsia: an exploratory study. Gen Hosp Psychiatry 2002;24(4):260-4.

223. Holditch-Davis D, Bartlett TR, Blickman AL, Miles MS. Posttraumatic stress symptoms in mothers of premature infants. J Obstet Gynecol Neonatal Nurs 2003;32(2):161-71.

224. Kersting A, Dorsch M, Wesselmann U, Ludorff K, Witthaut J, Ohrmann P, Hornig-Franz I, Klockenbusch W, Harms E, Arolt V. Maternal posttraumatic stress response after the birth of a very low-birthweight infant. J Psychosom Res 2004;57(5):473-6.

225. Soet JE, Brack GA, DiIorio C. Prevalence and predictors of women's experience of psychological trauma during childbirth. Birth 2003;30(1):36-46.

226. Tham V, Christensson K, Ryding EL. Sense of coherence and symptoms of post-traumatic stress after emergency caesarean section. Acta Obstet Gynecol Scand 2007;86(9):1090-6.

227. Iles J, Slade P, Spiby H. Posttraumatic stress symptoms and postpartum depression in couples after childbirth: The role of partner support and attachment. J Anxiety Disord 2011;25(4):520-30.

228. Hodnett ED, Downe S, Edwards N, Walsh D. Home-like versus conventional institutional settings for birth. Cochrane Database Syst Rev 2005;(1):CD000012.

229. CVZ (College voor Zorgverzekeringen). Verloskundig Vademecum 2003. Diemen (The Netherlands): 2003.

230. Waelput AJM, Hoekstra J. Verloskundige zorg samengevat. In: Volksgezondheid Toekomst Verkenning, ationaal Kompas Volksgezondheid. Bilthoven (The Netherlands): RIVM; 2008.

231. Rijnders M, Baston H, Schonbeck Y, van der Pal K, Prins M, Green J, Buitendijk S. Perinatal factors related to negative or positive recall of birth experience in women 3 years postpartum in the Netherlands. Birth 2008;35(2):107-16.

232. Parfitt YM, Ayers S. The effect of post-natal symptoms of post-traumatic stress and depression on the couple's relationship and parent-baby bond. J Reprod Infant Psychol 2009;27(2):127-42.

233. Gottvall K, Waldenstrom U. Does a traumatic birth experience have an impact on future reproduction? BJOG 2002;109(3):254-60.

234. Fuglenes D, Aas E, Botten G, Oian P, Kristiansen IS. Why do some pregnant women prefer cesarean? The influence of parity, delivery experiences, and fear. Am J Obstet Gynecol 2011;205(1):45-9.

235. NICE. Post-traumatic stress disorder; The management of PTSD in adults and children in primary and secondary care. London (UK): NICE guidelines; 2005.

236. American Psychiatric Association (APA). Practice Guidelines for the Treatment of Patients with Acute Stress Disorder and Posttraumatic Stress Disorder. Arlington, VA: American Psychiatric Association Practice Guidelines; 2004.

237. Sandstrom M, Wiberg B, Wikman M, Willman AK, Hogberg U. A pilot study of eye movement desensitisation and reprocessing treatment (EMDR) for post-traumatic stress after childbirth. Midwifery 2008;24(1):62-73.

238. Ayers S, Kenzie-McHarg K, Eagle A. Cognitive behaviour therapy for postnatal post-traumatic stress disorder: case studies. J Psychosom Obstet Gynaecol 2007;28(3):177-84.

239. Milgrom J, Negri LM, Gemmill AW, McNeil M, Martin PR. A randomized controlled trial of psychological interventions for postnatal depression. Br J Clin Psychol 2005;44(Pt 4):529-42.