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Posttraumatic Stress during Pregnancy and the Postpartum Period

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Abstract

Research on PTSD in pregnancy and postpartum is relatively new but clearly demonstrates the importance of recognising and treating women with PTSD at this time. Women with PTSD in pregnancy are at greater risk of pregnancy complications and health behaviours that have a negative impact on the woman and fetus. In addition, approximately 1 to 3% of women develop PTSD as a direct response to the events of birth; and rates are increased in high risk groups such as women who have preterm or stillborn infants or life-threatening complications during pregnancy or labour. Models of the etiology of postpartum PTSD focus on the interaction between individual vulnerability, risk, and protective factors during and after birth. To date, there is strongest evidence for the role of previous psychiatric problems, a history of trauma, severe complications during birth, support, and women's subjective experience of birth in postpartum PTSD. Very little research has examined screening or intervention, although intervention is possible at many levels. Midwife debriefing is commonly provided in the UK but there is inconsistent evidence of its efficacy. Further research is therefore desperately needed and we highlight key research topics that need addressing.

Keywords: PTSD, birth, labor, pregnancy

Introduction

Posttraumatic stress disorder (PTSD) has typically been associated with events such as war, sexual assault, and disasters. However, there is increasing evidence that it may also occur following childbirth. Case reports of women suffering PTSD type symptoms after birth can be traced back to the 1970s and 80s (Beech & Robinson, 1985; Bydlowski & Raoul-Duval, 1978). In 1997, a seminal prevalence study of 1,640 postpartum women set the foundation for this area of research (Wijma, Soderquist, & Wijma, 1997). Since then, research has established that PTSD symptoms do occur postpartum and that the etiology appears to be similar to PTSD after other events. There is also increasing evidence for the impact of PTSD in pregnancy on birth outcomes. However, it would be premature to conclude that PTSD after birth is comparable to PTSD after other events. Childbirth differs from other traumatic events in many ways including that it is usually entered into voluntarily, is broadly predictable, is experienced by the majority of women in the population, is viewed positively by society, and yet involves large physiological changes and breeches of bodily integrity that not all other traumatic events involve (Ayers, Joseph, McKenzie-McHarg, Slade, & Wijma, 2008).

Pregnancy and the birth of a new baby also require substantial adjustment and are associated with other psychological problems, such as depression, anxiety, and postpartum bonding difficulties. This means comorbidity is high, and transdiagnostic symptoms may inflate estimates of PTSD prevalence. Symptoms of PTSD may also be affected by normal physiological changes or fatigue during pregnancy and after birth. The importance of pregnancy and the postpartum period in terms of fetal development, the development of the mother-infant bond, and infant attachment also means the potential impact of PTSD during this time is substantial and may differ to that of PTSD occurring at other points in life.

In this chapter, we examine the concept of PTSD and how its evolution influenced the recognition and study of postpartum PTSD. Following this, we look at the influence of PTSD on pregnancy; then the evidence for postpartum PTSD in terms of prevalence, etiology and the impact on women and their families. Finally, we briefly outline possibilities for assessment and treatment.

PTSD and its application to birth

PTSD occurs in response to very stressful or traumatic events. It is therefore one of a few psychiatric diagnoses that require exposure to a specific event in order to occur. This event is known as the ‘gateway criterion’ or criterion A. The concept of a ‘traumatic event’ has been widely criticised for confusing the event with a person’s subjective evaluation of that event as traumatic. The definition of what constitutes a traumatic event therefore has a history of controversy and change. These changing criteria for what constitutes a traumatic event has been highly pertinent to the field of postpartum PTSD because childbirth is a common event that is not experienced as traumatic by the majority of women.

PTSD was first included in the psychiatric nomenclature in 1980 in the American Psychiatric Association’s Diagnostic and Statistical Manual 3rd edition (DSM-III). The DSM-III specified that for PTSD to occur, the person must have experienced an event that was outside the usual range of human experience and that would cause significant symptoms of distress in almost everyone. These criteria arguably excluded childbirth because it is a normative event experienced by many women, the majority of whom will not be significantly distressed by it. Under this definition, it was possible to diagnose PTSD following an abnormal complicated birth but not after obstetrically normal births. This undoubtedly contributed to the lack of research into postpartum PTSD during this time.

The DSM was revised in 1994 (DSM-IV; American Psychiatric Association, 1994) to include more sophisticated stressor criteria that recognised the importance of a person’s

individual appraisal of the event. In this edition, stressor criteria were that a person had to have (a) experienced an event in which he or she believed his or her own or another person's life or physical integrity was threatened, and (b) responded with intense fear, helplessness, or horror. This definition legitimised the study of PTSD in relation to birth but was criticised as leading to 'conceptual bracket creep' (McNally, 2003), where PTSD became diagnosed in relation to many common life events, such as bereavement, road traffic accidents, and illnesses.

In addition to the stressor criteria, the DSM-IV-TR (American Psychiatric Association, 2000) include the presence of three types of symptoms: (1) re-experiencing symptoms such as upsetting thoughts, images, and nightmares about the event; (2) avoidance and numbing symptoms such as trying to avoid thoughts or reminders of the event and feeling numb, distant, and cut off from those around you; and (3) hyperarousal symptoms such as sleep disturbances, being overly vigilant, and irritable. For a diagnosis of PTSD, symptoms should be experienced for longer than one month and cause significant distress, disability, and impaired functioning. Research also suggests that particular symptoms may be more predictive of poor outcome. For example, Kuhn, Blanchard, and Hickling (2003) found that symptoms of emotional numbing were particularly predictive of poor psychosocial functioning following motor vehicle accidents.

The next revision of the DSM (DSM-V; see www.dsm5.org) reclassifies PTSD by moving it from anxiety disorders to a group of trauma and stressor-related disorders that include reactive attachment disorder, disinhibited social engagement disorder, acute stress disorder, adjustment disorders, and other specified or unspecified trauma or stressor related disorders. Stressor criteria are also reduced so that the event only needs to involve perceived threat and not a response of fear, helplessness, or horror. A fourth cluster of symptoms has also been added that covers negative alterations in cognitions and mood, such as amnesia for

aspects of the event, negative cognitions about self, others or the world, distorted blame of self or others, and the inability to experience positive emotions .

Research on postpartum PTSD has predominantly measured symptoms of PTSD as oppose to full DSM criteria. PTSD symptoms are most commonly measured by asking women to report only those symptoms that arose from the birth experience (e.g., intrusive thoughts about the birth). The pattern of symptoms in postpartum women may differ from other populations. For example, motherhood and postpartum healthcare make it difficult for women to avoid reminders of the birth, potentially resulting in fewer symptoms of avoidance. Symptoms of arousal may also be affected by normal postpartum factors such as physiological changes and fatigue. There is some evidence to support this, with studies showing that women with postpartum PTSD have fewer avoidance symptoms and more arousal symptoms compared to re-experiencing symptoms (Cigoli, Gabriella Gilli, & Emanuela Saita, 2006; Czarnocka & Slade, 2000; Lemola, Stadlmayr, & Grob, 2007; Maggioni, Margola, & Filippi, 2006; Soet, Brack, & Dilorio, 2003). A factor-analytic study on a sample of 1,423 women found that postpartum symptoms formed two clusters of (1) re-experiencing and avoidance of the birth, and (2) emotional numbing and hyperarousal symptoms. This study also confirmed that the prevalence of avoidance symptoms was lower (27%) and hyperarousal symptoms higher (58%) than re-experiencing symptoms (38%) in postpartum women¹ (Ayers, Harris, Sawyer, Parfitt, & Ford, 2009).

The results of these studies of the pattern of postpartum PTSD symptoms have a number of implications. First, they suggest hyperarousal symptoms may be over-inflated by normal postpartum factors. Second, they emphasise the importance of measuring all the diagnostic criteria for PTSD and not relying on symptoms, which may over-estimate pathology. Third, they suggest that it may be more useful to focus on other PTSD criteria,

¹ Percentages based on the community sample in Ayers et al (2009)

such as disability and impairment, which are less likely to be confounded by postpartum factors and may be more indicative of need for treatment.

PTSD in pregnancy

The experience of traumatic events is remarkably common in society. Epidemiological research suggests approximately 80% of people experience a traumatic event at some point in their lives (Breslau, 2009). PTSD is also twice as common in women as in men with a lifetime prevalence of PTSD in women of approximately 10% (National Comorbidity Survey Replication, 2005). It is therefore inevitable that a proportion of women will approach childbearing with a history of trauma and/or PTSD, and this may have consequences for the health of their pregnancy and its outcome. One United States (US) study looking at pregnant women in both private and publicly funded medical settings found current rates of PTSD in 2.7% of private patients and 13.9% of publicly funded patients. PTSD was elevated in African American women, teenagers, those living in poverty, those who were less educated, and those who lived in socially deprived areas (Seng, Low, Sperlich, Ronis, & Liberzon, 2009). The highest rates of PTSD were found in women with a history of childhood abuse or a previous reproductive trauma.

Evidence suggests that women with PTSD are at increased risk of specific pregnancy complications. One epidemiological study in the US (Seng et al., 2001) found an increased risk of ectopic pregnancy, miscarriage, hyper-emesis, preterm contractions, and excessive fetal growth in the group of women with a diagnosis of PTSD. It is thought that there are two pathways by which PTSD impacts on pregnancy outcomes. First, PTSD may cause hormonal alterations in the body. For example it is thought that PTSD causes dysregulation of the hypothalamic pituitary adrenal (HPA) axis which is the main system for responding to stress (Selye, 1956). Normally, cortisol levels increase in response to a stressor as part of the “fight or flight” response (Dickerson & Kemeny, 2004). However, paradoxically, people with

PTSD have lower cortisol levels and show a lower rise in cortisol in response to a new stressor. They also do not display the same diurnal fluctuations as those without the disorder (Yehuda, 2001). This may be because the HPA axis and cortisol response become dysregulated because of the person's exposure to intense acute stress and trauma.

The cortisol response is also important in pregnancy. In early pregnancy, high levels of cortisol are associated with miscarriage and preterm birth. However, in the final weeks of pregnancy cortisol levels naturally increase two to three times higher than normal (Challis, Sprague, & Patrick, 1983). This surge in cortisol is thought to play a vital role in maturation of the fetus before birth. A pilot study by Seng et al. (2005) found that the cortisol dysregulation associated with PTSD (i.e. lower levels of cortisol) also occurs in pregnancy. PTSD symptoms in their sample of 25 pregnant women were correlated with worse perinatal outcomes, as measured by the sum of 52 pregnancy, birth, neonatal, and postpartum outcomes e.g. use of medication, induced labour, perineal tear, pre-eclampsia, stillbirth. A further study showed that fear of delivery and diurnal cortisol responses were associated with a more negative childbirth experience and that both predicted more avoidance behaviours (associated with PTSD) in the week after delivery (Alder et al., 2011). More research is needed into the complex neurobiological mechanisms involved in PTSD, which may impact on pregnancy and labour processes to influence outcomes.

A second pathway by which PTSD may affect outcomes is through altered health behaviours. Studies have shown more risk behaviours in abuse survivors during pregnancy, such as smoking, drinking alcohol, substance misuse, and excessive weight gain (Morland et al., 2007; Seng, Sperlich, & Low, 2008). These behaviours in turn will have negative impacts on pregnancy outcomes. For example, smoking in pregnancy is associated with preterm birth, infant morbidity (e.g. low birth weight, respiratory problems) and infant mortality (Cnattingius, 2004). Obesity during pregnancy is also associated with maternal morbidity and

mortality. A study of over 280,000 women found obese women were at increased risk of gestational diabetes, pre-eclampsia, induced labour, emergency caesarean section, postpartum haemorrhage, infections, and high infant birth weight compared to women within the normal weight range (Sebire, Jolly, Harris, Wadsworth, Joffe, Beard, Regan & Robinson, 2001).

These two pathways have been drawn together in a conceptual framework (Seng, 2002), whereby violence and trauma can lead to both physical injury and PTSD. Injury may have a direct effect on pregnancy outcome, but PTSD is likely to affect outcomes by the two indirect pathways described above, a neuroendocrine pathway and increased risk behaviours. In addition, Seng suggests these effects are may be moderated by factors, such as life events and new stressors increasing risk, and modifiable healthcare related factors, such as seeking appropriate maternity care, engaging in positive health behaviours, and having adequate social support, decreasing risk.

Assessment or screening for PTSD in pregnant women is therefore advisable and additional vigilance and support is likely to be needed to help these women achieve the best possible pregnancy outcomes. In addition, women with a history of sexual or physical abuse may need very sensitive care during both pregnancy and labour due to the intimate nature of examinations and possibility of exposure, loss of control, and painful interventions which can occur during childbirth.

Postpartum PTSD

Prevalence

Studies of postpartum PTSD in various countries suggest between 0 and 8% of women have PTSD in the first year postpartum (Adewuya, Ologun, & Ibigbami, 2006; Alcorn, O'Donovan, Patrick, Creedy, & Devilly, 2010; Ayers et al., 2009; Czarnocka & Slade, 2000; Soet et al., 2003; White, Matthey, Boyd, & Barnett, 2006; Wijma et al., 1997). This variation in prevalence is probably due to a number of factors, such as cross-cultural

differences, sampling method, and type of measurement. As mentioned above, a few key methodological issues need to be considered when trying to establish prevalence in this field. These include potential over-inflation by normal postpartum symptoms and the lack of validated measures of postpartum PTSD. Very few studies have used clinical interviews, which are seen as the gold standard for establishing prevalence of psychological disorders (see Navarro et al., 2008, and Wenzel, Haugen, Jackson, & Brendle, 2005, for exceptions). Studies using questionnaires tend to use PTSD measures developed for use in other populations. Therefore, in addition to the usual problems of questionnaire measures, these have to be adapted to be childbirth-specific. Sampling is also critical, as research shows higher prevalence rates are observed in self-selected samples, particularly those recruited via the Internet (Ayers et al., 2009; Beck, Gable, Sakala, & Declercq, 2011).

Another important issue when examining postpartum PTSD is distinguishing between women who have pre-existing PTSD and those who develop PTSD as a direct result of childbirth. Although the majority of prevalence studies have measured PTSD symptoms in relation to childbirth, few have examined trauma history, PTSD symptoms in relation to other traumas, and PTSD in pregnancy. Prospective studies measuring PTSD in pregnancy and considering onset of new cases of PTSD following childbirth are rare. Those studies that have been done indicate more women report PTSD symptoms in pregnancy than after birth. This is almost certainly because measures in pregnancy include PTSD in response to all events, whereas measures after birth only include PTSD in relation to birth. These studies show that after removing women with PTSD in pregnancy, a further 1 to 3% of women develop a new episode of PTSD as a direct result of childbirth (Alcorn et al., 2010; Ayers & Pickering, 2001). Although this may not appear to be a large proportion, the amount of women giving birth every year means that postpartum PTSD potentially affects a large number of women. For example, every year approximately 4.1 million women in the US and

0.6 million women in the UK give birth. A prevalence of 1 to 3% therefore means up to 141,000 women in these two countries alone may suffer from postpartum PTSD every year.

There are, of course, high-risk groups in which the prevalence of postpartum PTSD is higher. These include women who suffer late pregnancy loss or stillbirth (Turton, Hughes, Evans, & Fainman, 2001), women who have severe labour complications (Engelhard et al., 2002; Hoedjes et al., 2011), and women who have preterm babies (Elklit, Hartvig, & Christiansen, 2007). In these groups, postpartum PTSD is found in between 17 and 76% of women (Elklit et al., 2007; Jotzo & Poets, 2005; Kersting et al., 2009; Turton et al., 2001). We examine this in more detail later in this chapter.

A common question raised is whether men who attend the birth of their child might also be affected. Very few studies have examined this, and the evidence is limited to qualitative research or questionnaire surveys (Ayers, Wright, & Wells, 2007; Bradley & Slade, 2011; Nicholls & Ayers, 2007; White, 2007). Nonetheless, this evidence suggests a small proportion of men may also experience PTSD symptoms in relation to childbirth. It appears to affect fewer men than women, which is to be expected as the trauma of birth is experienced vicariously by men. This gender difference is also consistent PTSD prevalence in the general population (National Comorbidity Survey Replication, 2005).

Finally, it should be acknowledged that establishing prevalence rates rests on a potentially arbitrary dichotomy of whether women have PTSD or not, on the basis of whether they fulfil all diagnostic criteria. In reality, many women have symptoms of PTSD, but do not meet all diagnostic criteria. Some researchers have therefore tried to quantify the proportion of women with ‘partial’ or ‘subclinical’ PTSD, suggesting that up to 30% of women suffer significant symptoms of PTSD (Czarnocka & Slade, 2000; Davies, Slade, Wright, & Stewart, 2008; Soet et al., 2003). Unfortunately, there is no clear agreement on how partial or subclinical PTSD should be defined, so these rates are unreliable. What is

clear, however, is that prevalence rates do not capture all the women who report PTSD symptoms, and many women with ‘subclinical’ PTSD symptoms may still suffer and benefit from treatment.

Course and comorbidity

Evidence on the course of PTSD postpartum is sparse and inconsistent. A few studies find that cases of PTSD decrease over time, particularly in the first three to six months after birth (Ayers & Pickering, 2001), which suggests some women with initial PTSD recover spontaneously during this time. This is consistent with research looking at PTSD after other events, which shows a rapid decrease in PTSD during the first three months after the event, and much less after this point (Rothbaum & Foa, 1993). However, other studies have found that PTSD rates increase or stay the same in the first six months after birth (Alcorn et al., 2010). One study that followed women over 1 year postpartum found that prevalence in the first seven months was fairly stable (range 1.3 to 1.7%) but significantly reduced at 11 months postpartum (0.9%) (Soderquist, Wijma, & Wijma, 2006). It is therefore possible that recovery may still be observed in women one or more years after birth. However, more research is needed to determine the course of PTSD after childbirth and in particular whether it is naturally remitting or if a proportion of cases remain chronic if not treated.

PTSD is known to be highly comorbid with other disorders, such as depression and substance misuse, in the general population. This is also the case for PTSD in pregnancy and postpartum. PTSD in pregnancy is associated with increased health risk behaviours, anxiety, and depression (Busari, 2010; Seng et al., 2009; Smith, Poschman, Cavaleri, Howell, & Yonkers, 2006). Postpartum research suggests between 28 and 74% of women with postpartum PTSD have probable depression (Alcorn et al., 2010; Parfitt & Ayers, 2009; White et al., 2006). We know very little about the comorbidity of postpartum PTSD with other disorders such as substance use, panic, and generalised anxiety disorder. Given the

importance of the postpartum period for the mother-baby bond and developing infant, it is important that future research examines comorbidity between postpartum PTSD and other disorders, especially maternal bonding disorders.

High risk groups

Some women may be more at risk of PTSD than others due to events in their pregnancy that involve actual or perceived threat to their own or their baby's life. These events include stillbirth and perinatal loss, preterm birth or the need for neonatal special care, and life-threatening complications like pre-eclampsia. In addition, adolescent mothers may be a high risk group, although evidence is currently sparse.

Stillbirth and perinatal loss

Stillbirth and perinatal loss are relatively uncommon, but research suggests that 15 to 25% of women who experience them have enduring adjustment problems (Bennett, Litz, Maguen, & Ehrenreich, 2008). Turton et al. (2001) estimated that the lifetime risk for PTSD from perinatal loss was 29% and that approximately 20% of mothers experience depression and PTSD in their subsequent pregnancy. At present, the various factors (individual, familial, economic, medical, cultural, and religious) that affect long-term psychological reactions to perinatal loss are not well known. Turton et al. (2001) examined correlates and predictors of PTSD symptoms in women who were pregnant again after having a previous stillbirth. They found that medical history, including history of mental illness, previous experience of early miscarriage or pregnancy termination, and the gestational age of the lost pregnancy were not significantly associated with PTSD. Factors that were associated with PTSD in this study were getting pregnant very quickly after the stillbirth, as well as concurrent symptoms of depression and state-anxiety. A seven year follow up of this cohort found that stillbirth was associated with subsequent relationship breakdown, particularly in those women who had PTSD (Turton, Evans, & Hughes, 2009).

Preterm infants and those needing special care

Giving birth very early or to a very small baby can be a very stressful experience for parents, and this stress tends to be compounded by the baby subsequently needing a long stay in the neonatal unit. Studies looking at PTSD in mothers of preterm babies show very high prevalence rates in the first few weeks (28 to 76%), which decreases over time to between 7 and 20 % at six months (Binder et al., 2011; Jotzo et al., 2005; Kersting et al., 2009).

However, this is still high compared to women whose babies are born at full term. A comparison of mothers of very low birth weight (<1500g) infants, with mothers of healthy babies born at term, found significantly more traumatic symptoms in the very low birth weight mothers at all time points measured, from 1 to 3 days to 14 months after birth (Kersting et al., 2004). Another study found that this difference remained 2 to 3 years after the birth (Åhlund, Clarke, Hill, & Thalange, 2009). A further study of mothers of extremely or very low birth weight infants found that handicap of the child, general distress during hospitalization, distressing contact with hospital staff, experienced distress at homecoming, and emotional coping all contributed to mothers feeling traumatised (Elklit, Hartvig, & Christiansen, 2007).

Pre-eclampsia and HELLP syndrome

Pre-eclampsia is a pregnancy related condition characterised by increased blood pressure and protein in the urine. Patients, particularly those with early onset pre-eclampsia (<32 weeks) may develop severe symptoms, such as upper abdominal pain, headache, vision disturbances, weakness, and discomfort. Onset is often sudden, and if the condition develops into HELLP syndrome (Haemolysis, Elevated Liver enzymes and Low platelets Syndrome) or full eclampsia, it is potentially fatal. The only treatment is to induce birth of the baby, even if this is many weeks early, thereby resulting in the birth of a preterm infant at high risk of complications (Engelhard et al., 2002). In Engelhard et al.'s study (2002), a quarter of women

having a preterm birth developed PTSD. In women who developed pre-eclampsia at full-term, the rate of PTSD (17%) was much higher than in women who went to full term and did not develop pre-eclampsia (0%). However, a Dutch study of women with pre-eclampsia found rates of 8.6% six weeks after birth and 5.1% twelve weeks after birth (Hoedjes et al., 2011). Younger age of the mother, more severe pre-eclampsia, delivery by caesarean section, lower gestational age, lower birth weight, admission to neonatal intensive care units, and perinatal death were all associated with PTSD symptoms. This lack of consistency in prevalence is probably because studies have used self-report questionnaires that are not typically used as diagnostic measures.

Adolescent mothers

There is emerging evidence that adolescent mothers may be more at risk of PTSD relative to adult mothers. One study found that one third of adolescent mothers appraised childbirth as traumatic and that 50% displayed symptoms suggestive of trauma within three days of the birth (Anderson, 2010). Seng et al. (2009) found that teenage motherhood was predictive of PTSD during pregnancy, and a study investigating pregnant teenagers in Brazil (Ferri et al., 2007) found that 22% of teenagers reported a lifetime history of violence and 24% had a common mental disorder such as depression or anxiety, which was higher than in an adult population. Violence and mental ill health in pregnancy are associated with poorer pregnancy outcomes, such as miscarriage (Carbone-López, Krusttschnitt & Macmillan, (2006), thus potentially putting adolescents at higher risk. Pregnant adolescents approaching birth are likely to have fears that differ from adult women's fears due to a younger developmental stage or possibly limited education. It has been found that their fears centre on medical personnel, the hospital, medical procedures, and actually splitting open during the birth (Montgomery, 2003). To feel safe, adolescents most want pain relief, non-judgmental nursing care, and emotional support during labour (Sauls, 2004).

The etiology of postpartum PTSD

Even in high risk groups, it is clear that not everybody who experiences a traumatic event develops PTSD. Some acute stress responses are normal following a stressful event and should not be pathologised. Theories of PTSD put varying emphasis on factors such as stress responses, information processing, and conditioning in explaining the etiology of PTSD. Many of these share the assumption that during the traumatic event, emotional, behavioural, and cognitive fear responses are evoked by the experience or threat to oneself or a significant other. Conditioning processes mean that stimuli associated with the trauma may subsequently trigger fear and anxiety responses. Information processing approaches suggest that traumatic memories differ from everyday autobiographical memories both in content and underlying processes; resulting in symptoms of re-experiencing the event (e.g., intrusive thoughts, nightmares) as well as memories being more likely to be triggered by associated stimuli (Brewin, 2007; Brewin, Dalgleish, & Joseph, 1996; Horowitz, 1986). Maladaptive appraisals and coping after the event may then contribute toward the development of PTSD and/or prevent recovery (Brewin & Holmes, 2003; Ehlers & Clark, 2000). For example, sufferers may appraise the symptoms as meaning they are going mad or cannot cope, which will increase anxiety and prevent resolution of symptoms. They also may start to avoid stimuli that remind them of the event when in fact repeated exposure to these stimuli (in the absence of threat) is more likely to resolve symptoms.

In relation to postpartum PTSD two models have been proposed that summarise potential aetiological factors. Slade (2006) outlined a two dimensional framework of individual and environmental characteristics that contribute to predisposing and precipitating factors for PTSD. Predisposing factors in pregnancy are all internal and are specified as fear of labor, depression in pregnancy, history of mental health problems and sexual trauma. Precipitating factors can be internal or external and are specified as fear, lack of control, pain

and birth not being as expected (internal); and operative births or the partner not being present (external). In addition, Slade specifies factors that may interact with predisposing or precipitating factors, namely unplanned pregnancy, low support during pregnancy and during birth, and feeling poorly informed.

Ayers (2004) reviewed the evidence for factors associated with postpartum PTSD and put forward a diathesis-stress model of the aetiology of postpartum PTSD; a revised version of which is shown in Figure 1. Similar to Slade (2006), this model specifies that PTSD arises from an interaction between individual vulnerability prior to birth and risk factors during birth. However, this model also specifies the possible mediating role of women's appraisals of birth; and includes a temporal dimension that allows for spontaneous recovery or maintenance of PTSD symptoms over time, which can be influenced by maladaptive appraisals and coping, postpartum support, and additional stress.

The models put forward by Slade (2006) and Ayers (2004) offer useful frameworks for summarising and conceptualising key vulnerability and risk factors involved in the development of postpartum PTSD. The evidence for these models is largely limited to research that examines a few of the variables within each model. Some variables are also less researched than others with, for example, the role of postpartum factors being less researched than antenatal or birth factors. Although neither model has been tested in its entirety, they offer useful frameworks with which to consider the etiology of postpartum PTSD. An overview of the evidence for the factors in Figure 1 is provided below.

Insert Figure 1

Individual vulnerability

A wide range of individual vulnerability factors have been examined in relation to postpartum PTSD. The most evidence supports Figure 1's variables of a history of previous trauma or psychological problems, anxiety in pregnancy, fear of childbirth, and parity. For

example, a study of 1,224 women from early pregnancy to 11 months postpartum found that postpartum PTSD was predicted by depression in pregnancy, severe fear of childbirth, previous psychological problems, counselling for pregnancy or childbirth related problems, and low perceived social support after birth (Soderquist et al., 2006).

The most robust findings on vulnerability for postpartum PTSD are those for psychiatric history and previous trauma. A history of psychiatric problems or of receiving treatment for psychiatric problems is consistently associated with postpartum PTSD symptoms (Cigoli, Gilli, & Saita, 2006; Czarnocka & Slade, 2000; Soderquist, Wijma, & Wijma, 2006; Wijma, Soderquist, & Wijma, 1997). Other variables related to mental health have also been associated with PTSD symptoms, such as high trait anxiety (Czarnocka & Slade, 2000; Soet et al., 2003), neuroticism (Engelhard, van den Hout, & Kindt, 2003; Lyons, 1998) and anxiety sensitivity in pregnancy (Fairbrother & Woody, 2007; Keogh, Ayers, & Francis, 2002). Depression may also be a risk factor, particularly if women experience it in pregnancy (Cigoli et al., 2006; Cohen, Ansara, Schei, Stuckless, & Stewart, 2004; Maggioni et al., 2006; Soderquist, Wijma, Thorbert, & Wijmad, 2009; Soderquist et al., 2006).

Similarly, a history of abuse or trauma, particularly sexual abuse, is consistently associated with PTSD symptoms after childbirth (Ayers et al., 2009; Cohen et al., 2004; Kennedy & MacDonald, 2002; Lev-Wiesel, Daphna-Tekoah, & Hallak, 2009; Soet et al., 2003). A history of multiple traumatic exposures may reduce coping ability (Callahan & Borja, 2008), and this may be particularly important if the traumas are of an interpersonal nature. Reynolds (1997) discussed the relation between sexual abuse and traumatic birth and argued that labour sensations and interventions, such as examinations or being tied down by monitors or drips, may precipitate a reliving of the original sexual abuse. Insensitive instructions from staff can also bring back memories of the abuse, such as being told to “open your legs” or “be a good girl” (Reynolds, 1997).

The role of parity and fear of childbirth is less consistent and both are probably complicated by their associations with other vulnerability and risk factors. For example, nulliparous women (those who have never given birth) report greater fear of childbirth (Fenwick, Gamble, Nathan, Bayes, & Hauck, 2009; Johnson & Slade, 2002; Rouhe, Salmela-Aro, Halmesmaki, & Saisto, 2009) and more symptoms of PTSD after birth (Ayers et al., 2009; Denis, Parant, & Callahan; Wijma et al., 1997) than multiparous women. However, the association between parity and PTSD is not consistent (Soderquist et al., 2006) and one study found that the effect of parity on PTSD disappeared once complications of labour and delivery were controlled for (Soderquist, Wijma, & Wijma, 2002). It is therefore likely that any effect of parity is mediated by other factors, such as fear of childbirth or higher rates of complications in nulliparous women.

A similar argument could be made for fear of childbirth. The association between fear of childbirth and PTSD symptoms is inconsistent (Fairbrother & Woody, 2007; Soderquist et al., 2009). Like parity, these inconsistent findings are probably due to the association between fear of childbirth and other vulnerability factors, such as anxiety in pregnancy (Laursen, Hedegaard, & Johansen, 2008; Zar, Wijma, & Wijma, 2002) and increased intervention during birth (Fenwick et al., 2009; Laursen, Johansen, & Hedegaard, 2009).

Various other vulnerability factors have been examined. These include ethnicity, age, education, beliefs and personality characteristics. There is very little evidence that sociodemographic factors, such as education, occupation, social class, income, or ethnicity, are associated with postpartum PTSD symptoms. The general PTSD literature also suggests the influence of sociodemographic factors on PTSD varies according to the population studied (Brewin, Andrews, & Valentine, 2000). This variation is evident within the perinatal literature, where it has been shown that PTSD in pregnancy is associated with a range of sociodemographic factors, whereas postpartum PTSD is not. In addition, some types of

beliefs or coping styles may be associated with PTSD, although evidence is currently weak. For example, Soet et al. (2003) found that self-efficacy, internal locus of control, and sense of coherence were all lower in a group of women showing PTSD symptoms compared to non-symptomatic women. The personality trait of neuroticism has also been associated with PTSD symptoms following pregnancy loss (Engelhard et al., 2003).

Birth factors

The events of birth are critical in the etiology of postpartum PTSD, and a diagnosis requires that birth involves perceived threat of serious injury or death. We have seen that women who suffer extreme complications, such as stillbirth or life threatening events, during pregnancy and labour are at greater risk of developing PTSD. In general, research shows that type of birth, particularly assisted vaginal delivery (with forceps or ventouse) or emergency caesarean section, is related to PTSD symptoms (Ayers et al., 2009; Creedy, Shochet, & Horsfall, 2000; MacLean, McDermott, & May, 2000; Soderquist, Wijma, & Wijma, 2002; Soderquist et al., 2009). However, other obstetric factors, such as a long labour, large blood-loss, and pain, are not consistently associated with traumatic stress symptoms or PTSD. For example, Soet et al. (2003) found that although labour characteristics such as pain and medical interventions were associated with appraising birth as traumatic, these factors did not predict symptoms of PTSD. It seems therefore that only severe complications, such as a difficult or emergency delivery, reliably predict postpartum PTSD symptoms. This is probably because severe complications are more likely to result in perceived life threat. In keeping with this, two reviews of the general PTSD literature have found that perception of life threat is the only event characteristic consistently associated with PTSD (Ozer, Best, Lipsey, & Weiss, 2003; Voges & Romney, 2003).

Although complications during birth are a risk factor for PTSD, many studies show that a significant proportion of women with postpartum PTSD symptoms have normal

vaginal deliveries (Ayers & Pickering, 2001; Soderquist et al., 2006). This suggests that obstetric factors explain only some of the variance in the development of PTSD following birth. In fact, there is robust evidence from PTSD literature in other populations and in relation to birth that subjective experience of the event is more important than objective severity in PTSD responses. For example, a study of 1,499 women in Norway used structural equation modelling to examine the role of vulnerability factors (fear of childbirth) and subjective and objective experience of birth in PTSD symptoms eight weeks after birth. This showed that subjective birth experience had the strongest effect on postpartum PTSD symptoms and mediated between fear of childbirth, obstetric factors and PTSD (Garthus-Niegel, von Soest, Vollrath & Eberhard-Gran, 2012).

Other aspects of the birth event are also important. These include psychological factors such as dissociation, perceived threat and intrapartum emotions, and social factors such as care and support during birth. Harris and Ayers (2012) explored this issue by asking 675 women who had difficult or traumatic births to describe the moments during birth that caused the most extreme distress (also known as trauma ‘hotspots’). This study found that although many of these hotspots involved obstetric events (36%) and problems with the baby (27%), a substantial proportion were due to interpersonal factors such as being ignored, perceiving that they were abandoned or unsupported, poor communication, and being put under pressure (37%). Emotional responses during hotspots included anger and negative affect (sadness and guilt) as well as DSM-IV criterion A responses of fear, helplessness, and horror. This study found that women were more at likely to have PTSD if their hotspots involved interpersonal or obstetric events, fear and lack of control, and dissociation (Harris & Ayers, 2012).

This role of dissociation in postpartum PTSD is consistent with research other trauma samples, which suggests it may be an early marker for the development of PTSD (Van Son,

Verkerk, Van der Hart, Komproe, & Pop, 2005; Van der Velden et al., 2006). Dissociation is a broad concept that refers to phenomena such as depersonalization, derealisation, amnesia, out of body experiences, altered time perception, or altered body image. These can occur during an overwhelming or traumatic event as a coping mechanism and may indicate the mind disengaging from the event as it is too extreme to process at the time. Nijenhuis et al. (2001) suggested that dissociation is a manifestation of acute integrative failure, which sets the stage for the failure to synthesize and personify the traumatic experience in the long run, thereby resulting in increased symptoms. In postpartum research, there is evidence that intrapartum dissociation is associated with PTSD symptoms (Harris & Ayers, 2012; Lev-Wiesel & Daphna-Tekoah, 2010; Olde et al., 2005). For example, Olde et al. (2005) found that intrapartum dissociation was strongly related to PTSD symptoms three months after birth, even after controlling for negative emotions during birth. There is also some indication that women with a history of childhood sexual abuse are more likely to dissociate during birth (Lev-Wiesel & Daphna-Tekoah, 2010). However, the role of dissociation is not always consistent with one study finding no association between intrapartum dissociation and PTSD symptoms once intrapartum distress, dysphoric emotions, and life-threat were taken into account (Boudou, Sejourne, & Chabrol, 2007).

Social factors during birth are also important. It is well established that intrapartum support is associated with physical and psychological birth outcomes. A review of randomised controlled trials of continuous support during labour and birth concluded that it results in shorter labours, less use of analgesia, less assisted or operative deliveries, and greater satisfaction with birth (Hodnett, Gates, Hofmeyr, & Sakala, 2007). Lack of support is also strongly associated with PTSD (Brewin et al., 2000). Charuvastra and Cloitre (2008) reviewed the relevant PTSD literature and outlined of the degree to which the variance in the development of PTSD depends on interpersonal aspects of the traumatic event and the

recovery environment. For example, they summarised evidence that interpersonal traumas (i.e., those perceived to be deliberately perpetrated) are more potent stressors than those perceived to be accidental. This may particularly apply to childbirth, as studies have shown a link between PTSD symptoms and lack of satisfaction with communication by staff (Lyons, 1998), poor interaction with the medical personnel (Soet et al., 2003), perceived inadequate intrapartum care (Creedy et al., 2000), low staff and partner support (Czarnocka & Slade, 2000), being poorly informed and listened to (Czarnocka & Slade, 2000), inadequate contact with the staff (Wijma et al., 1997), and low perceived and desired support or help (Cigoli et al., 2006; Maggioni, et al., 2006). Indeed, an experimental study using birth vignettes showed that support from healthcare professionals had a greater effect on women's anxiety and mood than the severity of obstetric events (Ford & Ayers, 2009). Similarly, a prospective study measuring women's perceptions of support during birth and controlling for prior vulnerabilities and obstetric events found a direct association between support in birth and reduced PTSD symptoms postpartum. In addition, this effect of support on PTSD was particularly important for women who had high levels of intervention or complications during birth and for those who had a history of prior trauma (Ford & Ayers, 2011).

Postpartum factors

Unlike vulnerability and birth factors, the role of postpartum factors in the maintenance or recovery from postpartum PTSD has not been widely researched. Our understanding of this therefore relies heavily on the literature on PTSD in other populations. Cognitive theories of PTSD suggest that appraisal processes following the event will determine the onset and maintenance of symptoms (Ehlers & Clark, 2000). There is evidence to support this in postpartum women. For example, Wijma (1997) found that women with PTSD symptoms appraised the birth as significantly more negative than those without PTSD. In another study, negative appraisals of the birth were found to contribute to PTSD

symptoms, and this was independent of the type of delivery experienced (Edworthy, Chasey, & Williams, 2008). Other maladaptive appraisals and coping that have been associated with postpartum PTSD symptoms include self blame, staff blame, and fearfulness for self (Czarnocka & Slade, 2000). Only one study to date has applied a cognitive theory of PTSD to childbirth. This study looked at how well Ehlers and Clark's (2000) model of maladaptive appraisals and coping explained postpartum PTSD symptoms. The results showed that the model was a good fit, explaining 23% of variance in PTSD symptoms three weeks postpartum. It was less powerful at predicting PTSD symptoms three months postpartum, but the addition of social support to the model at this point significantly improved its fit (Ford & Ayers, 2007).

The importance of postpartum support in ameliorating against PTSD is unsurprising. Meta-analyses of evidence from PTSD in other populations show that social support is consistently associated with reduced PTSD following traumatic events (Brewin et al., 2000; Charuvastra & Cloitre, 2008; Ozer et al., 2003) and the effect of support gets increasingly important as more time elapses since the event (Ozer et al., 2003). A supportive social network may increase a sense of resiliency, lessen somatic symptoms, and decrease general distress (Callahan & Borja, 2008). Similarly, studies of postpartum women find that poor social support is associated with greater PTSD symptoms (Cigoli et al., 2006; Lyons, 1998; Soderquist et al., 2006), and depression (Felice, Saliba, Grech, & Cox, 2004; Heh, Coombes, & Bartlett, 2004; Wang, Jiang, Jan, & Chen, 2003). However, the process by which support affects PTSD development is not entirely clear; there is some evidence that high levels of social support in the postpartum period can be protective against development of PTSD symptoms (Cigoli et al., 2006; Lyons, 1998). Other authors emphasise that, on the other hand, a lack of support may be a maintaining factor of PTSD symptoms (Bailham & Joseph, 2003; Slade, 2006). Measurement issues are also important to separate desired

support or need for support, which is likely to be higher in women with PTSD or depression, from actual levels of support.

Finally, the role of additional stressors in Figure 1 is largely speculative, although there is preliminary evidence that they are associated with PTSD (Alcorn et al., 2010; Onoye, Goebert, Morland, Matsu & Wright, 2009). Stressors can vary on many dimensions, such as time (acute/chronic), nature (daily hassles versus life events), and severity and we have a limited understanding of how these may or may not contribute to the development of postpartum PTSD. However, as the postpartum period is one of substantial adjustment and inherent stressors, such as sleep deprivation, it is highly likely that additional stressors will have negative effects. Meta-analyses of risk factors for PTSD in other populations also find that additional stressors are one of the strongest predictors of PTSD (along with lack of social support and trauma severity; Brewin et al., 2000).

The impact of PTSD on women and their families

Qualitative studies suggest traumatic birth has a profound effect on women and their relationships with their partner and infant (Ayers, Eagle, & Waring, 2006; Beck, 2011; Nicholls & Ayers, 2007). These studies suggest the impact of postpartum PTSD on the mother-infant bond and the couple's relationship may be substantial, but there is very little quantitative research on this topic. Qualitative research and case studies suggest postpartum PTSD is associated with either avoidant/rejecting behaviour or anxious/overprotective behaviour towards the infant (Ballard, Stanley, & Brockington, 1995; Nicholls & Ayers, 2007). The most rigorous quantitative study to date found that PTSD symptoms were associated with more negative perceptions of the infant and a poorer mother-infant bond (Davies et al., 2008). However, the majority of these associations were no longer significant when depression was controlled. In another study that controlled for depression, Parfitt and Ayers (2009) found that PTSD symptoms remained associated with the mother-infant bond;

but the effect on the couple's relationship was fully mediated by depression. It is therefore not clear at this stage whether (and how much of) the impact of PTSD on the mother-infant bond and couple's relationship is due to PTSD symptoms and/or comorbid symptoms of depression.

The impact of PTSD on the fetus and developing infant is of particular interest because of increasing evidence that stress and anxiety in pregnancy affects the neurodevelopment of the fetus and infant development (van den Berg, Mulder, & Glover, 2005). A review of this literature concluded that antenatal stress and anxiety is associated with poor emotional and cognitive development in infants, as well as increased risk of infant hyperactivity, anxiety, and language delay (Talge, Neal, & Glover, 2007). As PTSD has been classified as an anxiety disorder, it seems reasonable to speculate it may have a similar impact. Findings that PTSD in pregnancy is associated with specific physiological changes, such as cortisol dysregulation (Seng et al., 2005) also suggest physiological pathways through which fetal development may be affected. It is therefore surprising that very little research has examined the effect of postpartum PTSD on infant development. Bosquet Enlow et al. (2011) looked at the association between maternal PTSD symptoms and how infants responded to a stressful situation using the still-face paradigm. The results showed that PTSD in mothers was associated with infants being less emotionally reactive and showing more dysregulation of emotions. In a further study of mothers and infants six months after birth, infants of mothers with higher lifetime exposure to trauma and perinatal traumatic stress took longer to recover following this stressful situation – both in terms of cardiorespiratory rate and behavioural distress – than infants of mothers without PTSD. This difference was no longer apparent at 13 months, yet mothers with PTSD were still more likely to report their infants as having socio-emotional and behavioural problems than the mothers without PTSD (Bosquet Enlow et al., 2011; Bosquet Enlow et al., 2009). Therefore, any long term impact

of maternal PTSD on infant development (if indeed there is any) may be more attributable to maternal perceptions and behaviour than to an actual delay or problem in development. For example, a study of 21 infants six months after treatment in neonatal intensive care found that mothers with PTSD symptoms were less sensitive to their baby's state and less effective at structuring interaction with their infants than were mothers without PTSD symptoms (Feeley et al., 2011).

Traumatic birth also appears to have an effect on subsequent pregnancies. Qualitative research suggests that women who have had a traumatic birth experience have fewer subsequent children and a longer length of time before their next baby relative to women who have not had traumatic pregnancies (Beck & Watson, 2010). If the woman does have another baby, feelings of stress and anxiety about the forthcoming delivery may escalate during a subsequent pregnancy, especially in the third trimester (Ballard et al., 1995). The authors of a qualitative study of women's experiences of subsequent childbirth following a traumatic birth concluded it has the potential to either heal or retraumatise women. Women described 'riding the turbulent wave of panic during pregnancy' and using a variety of strategies to get through the months of pregnancy prior to the birth (Beck & Watson, 2010).

A traumatic delivery can also lead to severe fear of childbirth, known as tokophobia. One study found that fear of childbirth was higher in women with a previous caesarean section or assisted delivery (Rouhe et al., 2009), both of which are also associated with PTSD. There is also an association between fear of childbirth and preference for a caesarean section (Nieminen, Stephansson, & Ryding, 2009). A demand made for an elective caesarean section should be taken seriously, as it may indicate a previous traumatic birth (Spiegelberg Gardner, 2003). It can be speculated that the reason for requesting a caesarean is to anticipate more control over the next delivery, and thereby reduce anxiety about it. It also fits with the avoidance symptoms of PTSD, which would make it imperative for the sufferer to be able to

avoid a similar situation occurring again. Psychotherapy during pregnancy may be appropriate for women to explore their previous traumatic experience, and this may help some women attempt a vaginal delivery even after requesting a caesarean (Ryding, 1991). However, in some cases, women may be reluctant to do this whilst pregnant and anticipating the next birth. Therefore, supporting women's requests for the next birth may be the most appropriate response.

Assessment and treatment

Prevention and intervention for postpartum PTSD is possible pre- and postpartum as illustrated in Figure 2. Primary prevention can include screening women during pregnancy for key vulnerability factors and adapting care to prevent PTSD occurring. Many hospitals already use symbols on maternity notes to indicate women who need special care (e.g., a teardrop to indicate a previous stillbirth), so this could easily be extended to flag women at risk of birth trauma. The Birth Trauma Association in the UK has provided guidelines on aspects of care that may minimise the risk of birth trauma. These include keeping women fully informed of options and procedures, making women central in decision making, individualising care to women's needs, and ensuring midwives are trained to provide sensitive and responsive care (Birth Trauma Association, 2012).

Insert Figure 2

Secondary prevention is possible by screening women after birth to identify those who appraise the birth as traumatic, or who have initial PTSD symptoms. These women could then be offered brief interventions, such as psychoeducation or midwife counselling, to help symptoms resolve in the early postpartum period. Although there is no validated screening tool for postpartum PTSD there are a variety of questionnaire measures of PTSD symptoms that have been used in postpartum research. These include the Impact of Event Scale (Horowitz, Wilner, & Alvarez, 1979); the PTSD Symptom Scale – Self Report (Foa,

Cashman, Jaycox, & Perry, 1997); and the PTSD Questionnaire (adapted from the PTSD-I; Watson, Juba, Manifold, Kucala, & Anderson, 1991). Two scales have been developed specifically for childbirth: the Traumatic Event Scale (Wijma et al., 1997) for use with all women, and the Perinatal PTSD Questionnaire (Quinnell & Hynan, 1999; Callahan, Borja, & Hynan, 2006) for use with parents of premature babies. Although it is encouraging that birth-specific measures have been developed, neither of these measures have been validated against clinical interviews so information on sensitivity, specificity, and appropriate cut-off values is not yet available. One study that compared a birth specific measure (the Traumatic Event Scale) with a general measure (PTSD Symptom Scale – self report) found similar internal consistency and symptom clusters but poor agreement on the identification of diagnostic PTSD (Stramrood, Huis in't Veld, van Pampus, Berger, Vigerhoets, Willibrord, Schultz, van den Berg, van Sonderen & Paarlberg, 2010). This emphasises the difficulty measuring postpartum PTSD and the caution that needs to be adopted when interpreting postpartum PTSD studies.

Finally, tertiary intervention can be provided by ensuring women with PTSD receive appropriate treatment. Current guidelines for PTSD recommend the use of psychotherapy, with adjunctive pharmacotherapy for complex PTSD², PTSD with comorbid disorders or where therapy is not possible (NICE, 2005). Psychotherapeutic approaches with some evidence of effectiveness for PTSD include cognitive behaviour therapy, eye-movement desensitisation and reprocessing, and stress inoculation training (Foa, Keane, Friedman, & Cohen, 2009). However, with the exception of postpartum debriefing, there has been little or no research evaluating the efficacy of treatments for postpartum PTSD, so there is no clear evidence-base to guide perinatal trauma intervention services. As mentioned at the beginning of this chapter, trying to identify those women who require treatment may not be as simple as

² Complex PTSD occurs when people are exposed to repeated or prolonged trauma and usually involves some distortion to personality or sense of self.

classifying those who fulfil diagnostic criteria because symptoms may be inflated by normal postpartum factors. It may therefore be more useful to use factors like disability, impairment, or desire for treatment as a basis on which to allocate treatment.

One notable exception to the dearth of research on postpartum intervention is that for postpartum debriefing. Postpartum debriefing typically involves a midwife going through a woman's birth events with her, usually with the medical notes available. The use of debriefing for PTSD is controversial due to the lack of robust evidence in other populations that it is effective (Wessely & Deahl, 2003). Reviews of randomised controlled trials (RCTs) in other populations have concluded that there is little evidence debriefing is effective, and some evidence it may result in increased symptoms (Rose, Bisson, Churchill, & Wessely, 2002). Clinical guidelines for the treatment of PTSD therefore explicitly recommend *against* the use of debriefing (NICE, 2005).

Despite this, postpartum debriefing under various guises is offered by up to 78% of hospitals in the UK (Ayers, Claypool, & Eagle, 2006; Steele & Beadle, 2003). Evidence regarding the efficacy of postpartum debriefing is inconsistent, so there is clearly a gap between evidence and maternity practice (Rowan, Bick, & da Silva Bastos, 2007). However, it is not clear whether postpartum debriefing resembles psychological debriefing used in other populations because it has yet to be clearly defined. Nonetheless, six RCTs have evaluated postpartum debriefing using a range of eligibility criteria and outcomes. Four trials found debriefing had no effect on outcomes such as depression, PTSD, quality of life, parenting stress, and fear of childbirth (Kershaw, Jolly, Bhabra, & Ford, 2005; Priest, Henderson, Evans, & Hagan, 2003; Selkirk, McLaren, Ollerenshaw, McLachlan, & Moten, 2006; Small, Lumley, Donohue, Potter, & Waldenstrom, 2000; Small, Lumley, & Toomey, 2006). In contrast, two trials found postpartum debriefing was effective (Gamble & Creedy, 2004; Lavender & Walkinshaw, 1998). One possible explanation for this inconsistency is that

studies varied in whether they include all postpartum women or only high risk women. There is some indication that if debriefing is limited to women who fulfil DSM-IV criterion A for a traumatic birth then it is more likely to be effective. For example, Gamble et al. (2005) restricted their sample to women who fulfilled criterion A and provided two debriefing sessions four to six weeks apart. They found that debriefing led to reduced symptoms of PTSD, depression, stress, and self-blame three months later. Similarly, in a pragmatic evaluation of postpartum debriefing services, Meades, Pond, Ayers, & Warren (2011) found that in women who fulfilled criterion A, those who were referred to or requested postpartum debriefing showed significantly greater improvement in PTSD symptoms compared to women who did not request debriefing. These studies suggest that debriefing may be effective when used as a secondary intervention for women who have traumatic births (as defined by criterion A).

Thus, although there are many possibilities for prevention and intervention for postpartum PTSD, more research is needed to provide an adequate evidence base on which to implement screening and treatment. Postpartum debriefing is the only widely provided intervention but is controversial. There are indications that it may be effective when used with high risk women, but it needs to be clearly defined and rigorously evaluated before conclusions can be drawn.

Conclusions and directions for future research

In conclusion, although research on PTSD in pregnancy and postpartum is relatively new, it clearly demonstrates the importance of recognising and treating women with PTSD. Women with PTSD in pregnancy are at greater risk of pregnancy complications, health risk behaviours, and they show altered physiological responses to stress. In addition to this, approximately 1 to 3% of women develop PTSD as a direct response to the events of birth; and rates are increased in high risk groups such as women who have preterm or stillborn

infants or life-threatening complications during pregnancy or labour. Models of the etiology of postpartum PTSD focus on the interaction between individual vulnerability and risk and protective factors during and after birth. To date, there is strongest evidence for the role of previous psychiatric problems, a history of trauma, severe complications during birth, support during birth and women's subjective experience. However, this does not mean other variables are not important – in many cases there is just not enough research evidence from which to draw conclusions.

Future research is therefore desperately needed. Areas we have identified as particularly requiring more research include the longitudinal course of postpartum PTSD and comorbidity with other disorders; the role of dissociation and postpartum factors in the development and recovery from PTSD; evaluation of etiological models of postpartum PTSD; the impact of postpartum PTSD on the mother-baby bond and infant development; assessment and screening; and how to prevent and treat PTSD in pregnancy and after birth. We have also identified a variety of issues that need to be considered when carrying out future research. The first is that symptoms of PTSD may be over-inflated by normal pregnancy or postpartum factors. Research should therefore measure all diagnostic criteria and not rely on symptoms alone as an indicator of severity or need for treatment. The second is that a diagnostic approach to PTSD uses potentially arbitrary cut-offs to identify women who 'have PTSD' or not. Research suggests many women who do not fulfil criteria still suffer significant symptoms. It is therefore important to bear this in mind – particularly in research looking at need for treatment. Finally, research is also needed which moves beyond simply identifying factors associated with PTSD; and starts to look at the *interaction* between individual vulnerability, birth, and postpartum factors as specified by the aetiological models outlined in this chapter.

References

- Adewuya, A. O., Ologun, Y. A., & Ibigbami, O. S. (2006). Post-traumatic stress disorder after childbirth in Nigerian women: Prevalence and risk factors. *BJOG: An International Journal of Obstetrics and Gynaecology*, 113, 284-288.
- Alcorn, K. L., O'Donovan, A., Patrick, J. C., Creedy, D., & Devilly, G. J. (2010). A prospective longitudinal study of the prevalence of post-traumatic stress disorder resulting from childbirth events. *Psychological Medicine*, 40, 1849-1859.
- Alder, J., Breitingner, G., Granado, C., Fornaro, I., Bitzer, J., Hosli, I., et al. (2011). Antenatal psychobiological predictors of psychological response to childbirth. *Journal of the American Psychiatric Nurses Association*, 17, 417-425.
- American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition - Text Revision*. Washington, D.C.: American Psychiatric Association.
- American Psychiatric Association (1994). *Diagnostic and Statistical Manual for Mental Disorders, 4th Edition*. Washington, D.C.: American Psychiatric Association.
- American Psychiatric Association (1980). *Diagnostic and Statistical Manual for Mental Disorders, 3rd Edition*. Washington, D.C.: American Psychiatric Association.
- Ayers, S. (2004). Delivery as a traumatic event: Prevalence, risk factors, and treatment for postnatal posttraumatic stress disorder. *Clinical Obstetrics and Gynecology*, 47, 552-567.
- Ayers, S., & Pickering, A. D. (2001). Do women get posttraumatic stress disorder as a result of childbirth? A prospective study of incidence. *Birth*, 28, 111-118.
- Ayers, S., Claypool, J., & Eagle, A. (2006). What happens after a difficult birth? Postnatal debriefing services. *British Journal of Midwifery*, 14, 157-161.
- Ayers, S., Eagle, A., & Waring, H. (2006). The effects of childbirth-related post-traumatic stress disorder on women and their relationships: A qualitative study. *Psychology, Health and Medicine*, 11, 389-398.
- Ayers, S., Harris, R., Sawyer, A., Parfitt, Y., & Ford, E. (2009). Posttraumatic stress disorder after childbirth: Analysis of symptom presentation and sampling. *Journal of Affective Disorders*, 119, 200-204.
- Ayers, S., Joseph, S., McKenzie-McHarg, K., Slade, P., & Wijma, K. (2008). Post-traumatic stress disorder following childbirth: Current issues and recommendations for future research. *Journal of Psychosomatic Obstetrics and Gynecology*, 29, 240-250.
- Ayers, S., Wright, D. B., & Wells, N. (2007). Symptoms of post-traumatic stress disorder in couples after birth: Association with the couple's relationship and parent-baby bond. *Journal of Reproductive and Infant Psychology*, 25, 40-50.
- Bailham, D., & Joseph, S. (2003). Post-traumatic stress following childbirth: a review of the emerging literature and directions for research and practise. *Psychology, Health and Medicine*, 8, 159-168.

- Ballard, C. G., Stanley, A. K., & Brockington, I. F. (1995). Post-traumatic stress disorder (PTSD) after childbirth. *British Journal of Psychiatry*, 166, 525-528.
- Beck, C. T. (2011). A metaethnography of traumatic childbirth and its aftermath: amplifying causal looping. *Qualitative Health Research*, 21, 301-311.
- Beck, C. T., & Watson, S. (2010). Subsequent childbirth after a previous traumatic birth. *Nursing Research*, 59, 241-249.
- Beck, C. T., Gable, R. K., Sakala, C., & Declercq, E. R. (2011). Posttraumatic stress disorder in new mothers: results from a two-stage U.S. national survey. *Birth*, 38, 216-227.
- Beech, B. A., & Robinson, J. (1985). Nightmares following childbirth. *British Journal of Psychiatry*, 147, 586.
- Bennett, S. M., Litz, B. T., Maguen, S., & Ehrenreich, J. T. (2008). An exploratory study of the psychological impact and clinical care of perinatal loss. *Journal of Loss & Trauma*, 13, 485-510.
- Birth Trauma Association. (2012). Policy & charter. Retrieved 1st August, 2012, from <http://www.birthtraumaassociation.org.uk/policy.htm>
- Bosquet Enlow, M., Kitts, R. L., Blood, E., Bizarro, A., Hofmeister, M., & Wright, R. J. (2011). Maternal posttraumatic stress symptoms and infant emotional reactivity and emotion regulation. *Infant Behavior & Development*, 34, 487-503.
- Bosquet Enlow, M., Kullowatz, A., Staudenmayer, J., Spasojevic, J., Ritz, T., & Wright, R. J. (2009). Associations of maternal lifetime trauma and perinatal traumatic stress symptoms with infant cardiorespiratory reactivity to psychological challenge. *Psychosomatic Medicine*, 71, 607-614.
- Boudou, M., Sejourne, N., & Chabrol, H. (2007). Childbirth pain, perinatal dissociation and perinatal distress as predictors of posttraumatic stress symptoms. *Gynecologie Obstetrique & Fertilité*, 35, 1136-1142.
- Bradley, R., & Slade, P. (2011). A review of mental health problems in fathers following the birth of a child. *Journal of Reproductive and Infant Psychology*, 29, 19-42.
- Breslau, N. (2009). The epidemiology of trauma, PTSD, and other posttrauma disorders. *Trauma, Violence, & Abuse*, 10, 198-210.
- Brewin, C. R. (2007). Autobiographical memory for trauma: update on four controversies. *Memory*, 15, 227-248.
- Brewin, C. R., & Holmes, E. A. (2003). Psychological theories of posttraumatic stress disorder. *Clinical Psychology Review*, 23, 339-376.
- Brewin, C. R., Andrews, B., & Valentine, J. D. (2000). Meta-analysis of risk factors for posttraumatic stress disorder in trauma-exposed adults. *Journal of Consulting and Clinical Psychology*, 68, 748-766.
- Brewin, C. R., Dalgleish, T., & Joseph, S. (1996). A dual representation theory of posttraumatic stress disorder. *Psychological Review*, 103, 670-686.

- Busari, A. O. (2010). Prevalence of risk factors and posttraumatic stress disorder in low income pregnant women. *European Journal of Social Sciences*, 14, 480-488.
- Bydlowski, M., & Raoul-Duval, A. (1978). Un avatar psychique meconnu de la puerperalite: la nevrose traumatique post-obstetricale [a psychological manifestation unknown within paediatrics: the post-traumatic obsteric neurosis]. *Perspectives Psychiatriques*, 4, 321-328.
- Callahan, J. L., & Borja, S. E. (2008). Psychological outcomes and measurement of maternal posttraumatic stress disorder during the perinatal period. *Journal of Perinatal and Neonatal Nursing*, 22, 49-59.
- Callahan, J. L., Borja, S. E., & Hynan, M. T. (2006). Modification of the perinatal PTSD questionnaire to enhance clinical utility. *Journal of Perinatology*, 26, 533-539.
- Carbone-López, K., Krusttschnitt, C., & Macmillan, R. (2006). Patterns of intimate partner violence and their associations with physical health, psychological distress, and substance use. *Public Health Reports*, 121, 382-392.
- Challis, J. R. G., Sprague, C., & Patrick, J. E. (1983). Relation between diurnal changes in peripheral plasma progesterone, cortisol and estriol in normal women at 30-31, 34-35 and 38-39 weeks of gestation. *Gynecol Obstet Invest*, 16, 33-44.
- Charuvastra, A., & Cloitre, M. (2008). Social bonds and posttraumatic stress disorder. *Annual Review of Psychology*, 59, 301-328.
- Cigoli, V., Gilli, G., & Saita, E. (2006). Relational factors in psychopathological responses to childbirth. *Journal of Psychosomatic Obstetrics and Gynecology*, 27, 91-97.
- Cigoli, V., Gilli, G., & Saita, E. (2006). Relational factors in psychopathological responses to childbirth. *Journal of Psychosomatic Obstetrics & Gynecology*, 27, 91-97.
- Cnattingius, S. (2004). The epidemiology of smoking during pregnancy: Smoking prevalence, maternal characteristics, and pregnancy outcomes. *Nicotine and Tobacco Research*, 6, S125-S140.
- Cohen, M., Ansara, D., Schei, B., Stuckless, N., & Stewart, D. (2004). Posttraumatic stress disorder after pregnancy, labor and delivery. *Journal of Women's Health*, 13, 315-324.
- Creedy, D., Shochet, I., & Horsfall, J. (2000). Childbirth and the development of acute trauma symptoms. *Birth*, 27, 104-111.
- Czarnocka, J., & Slade, P. (2000). Prevalence and predictors of post-traumatic stress symptoms following childbirth. *British Journal of Clinical Psychology*, 39, 35-51.
- Czarnocka, J., & Slade, P. (2000). Prevalence and predictors of posttraumatic stress symptoms following childbirth. *British Journal of Clinical Psychology*, 39, 35-51.
- Davies, J., Slade, P., Wright, I., & Stewart, P. (2008). Posttraumatic stress symptoms following childbirth and mothers' perceptions of their infants. *Infant Mental Health Journal*, 29, 537-554.

- Denis, A., Parant, O., & Callahan, S. (2011). Post-traumatic stress disorder related to birth: A prospective longitudinal study in a French population. *Journal of Reproductive and Infant Psychology*, 29, 125-135.
- Dickerson, S. S., & Kemeny, M. E. (2004). Acute stressors and cortisol responses: Theoretical integration and synthesis of laboratory research. *Psychological Bulletin*, 130, 355-391.
- Edworthy, Z., Chasey, R., & Williams, H. (2008). The role of schema and appraisals in the development of post-traumatic stress symptoms following birth. *Journal of Reproductive and Infant Psychology*, 26, 123-138.
- Ehlers, A., & Clark, D. M. (2000). A cognitive model of posttraumatic stress disorder. *Behaviour Research and Therapy*, 38, 319-345.
- Elklit, A., Hartvig, T., & Christiansen, M. (2007). Psychological sequelae in parents of extreme low and very low birth weight infants. *Journal of Clinical Psychology in Medical Settings*, 14, 238-247.
- Engelhard, I. M., van den Hout, M. A., & Kindt, M. (2003). The relationship between neuroticism, pre-traumatic stress, and post-traumatic stress: A prospective study. *Personality and Individual Differences*, 35, 381-388.
- Engelhard, I. M., Van Rij, M., Boullart, I., Ekhart, T. H. A., Spaanderman, M. E. A., Van den Hout, M. A., et al. (2002). Posttraumatic stress disorder after pre-eclampsia: An exploratory study. *General Hospital Psychiatry*, 24, 260-264.
- Fairbrother, N., & Woody, S. R. (2007). Fear of childbirth and obstetrical events as predictors of postnatal symptoms of depression and post-traumatic stress disorder. *Journal of Psychosomatic Obstetrics and Gynecology*, 28, 239-242.
- Feeley, N., Zolkowitz, P., Cormier, C., Charbonneau, L., Lacroix, A., & Papageorgiou, A. (2011). Posttraumatic stress among mothers of very low birthweight infants at 6 months after discharge from the neonatal intensive care unit. *Applied Nursing Research*, 24, 114-117.
- Felice, E., Saliba, J., Grech, V., & Cox, J. (2004). Prevalence rates and psychosocial characteristics associated with depression in pregnancy and postpartum in Maltese women. *Journal of Affective Disorders*, 82, 297-301.
- Fenwick, J., Gamble, J., Nathan, E., Bayes, S., & Hauck, Y. (2009). Pre- and postpartum levels of childbirth fear and the relationship to birth outcomes in a cohort of Australian women. *Journal of Clinical Nursing*, 18, 667-677.
- Foa, E. B., Cashman, L., Jaycox, L., & Perry, K. (1997). The validation of a self-report measure of posttraumatic stress disorder: The posttraumatic diagnostic scale. *Psychological Assessment*, 9, 445-451.
- Foa, E. B., Keane, T. M., Friedman, M. J., & Cohen, J. A. (2009). *Effective treatments for posttraumatic stress disorder: Practice guidelines from the International Society for Traumatic Stress Studies* (Second edition). New York: Guilford Publications.
- Ford, E., & Ayers, S. (2009). Stressful events and support during birth: The effect on anxiety, mood and perceived control. *Journal of Anxiety Disorders*, 23, 260-268.

- Ford, E., & Ayers, S. (2011). Support during birth interacts with prior trauma and birth intervention to predict postnatal post-traumatic stress symptoms. *Psychology and Health*, 26, 1553-1570.
- Ford, E., Ayers, S., & Bradley, R. (2010). Exploration of a cognitive model to predict post-traumatic stress symptoms following childbirth. *Journal of Anxiety Disorders*, 24, 353-359.
- Gamble, J., & Creedy, D. (2004). Content and processes of postpartum counseling after a distressing birth experience: A review. *Birth*, 31, 213-218.
- Garthus-Niegel, S., von Soest, T., Vollrath, M. E., & Eberhard-Gran, M. (2012). The impact of subjective birth experiences on post-traumatic stress symptoms: a longitudinal study. *Archives of Women's Mental Health*. doi 10.1007/s00737-012-0301-3.
- Harris, R., & Ayers, S. (2012). What makes labour and birth traumatic? A survey of intrapartum 'hotspots'. *Psychology & Health*, 27, 1166-1177.
- Heh, S.-S., Coombes, L., & Bartlett, H. (2004). The association between depressive symptoms and social support in Taiwanese women during the month. *International Journal of Nursing Studies*, 41, 573-579.
- Hodnett, E. D., Gates, S., Hofmeyr, G., & Sakala, C. (2007). Continuous support for women during childbirth. *Cochrane Database of Systematic Reviews* (3).
- Hoedjes, M., Berks, D., Vogel, I., Franx, A., Visser, W., Duvekot, J., et al. (2011). Symptoms of post-traumatic stress after preeclampsia. *Journal of Psychosomatic Obstetrics and Gynaecology*, 32, 126-134.
- Horowitz, M. (1986). *Stress Response Syndromes*. Northvale, NJ: Jason Aronson.
- Horowitz, M., Wilner, N., & Alvarez, W. (1979). Impact of event scale: A measure of subjective stress. *Psychosomatic Medicine*, 41, 209-218.
- Johnson, R., & Slade, P. (2002). Does fear of childbirth during pregnancy predict emergency caesarean section? *BJOG: an International Journal of Obstetrics and Gynaecology*, 109, 1213-1221.
- Jotzo, M., & Poets, C. F. (2005). Helping parents cope with the trauma of premature birth: An evaluation of a trauma-preventive psychological intervention. *Pediatrics*, 115, 915-919.
- Kennedy, H. P., & MacDonald, E. L. (2002). "Altered consciousness" during childbirth: potential clues to post traumatic stress disorder? *Journal of Midwifery & Women's Health*, 47, 380-382.
- Keogh, E., Ayers, S., & Francis, H. (2002). Does anxiety sensitivity predict post-traumatic stress symptoms following childbirth? A preliminary report. *Cognitive Behaviour Therapy*, 31, 145-155.
- Kershaw, K., Jolly, J., Bhabra, K., & Ford, J. (2005). Randomised controlled trial of community debriefing following operative delivery. *BJOG: an International Journal of Obstetrics and Gynaecology*, 112, 1504-1509.

- Kersting, A., Kroker, K., Steinhard, J., Hoernig-Franz, I., Wesselmann, U., Luedorff, K., et al. (2009). Psychological impact on women after second and third trimester termination of pregnancy due to fetal anomalies versus women after preterm birth-a 14-month follow up study. *Archives of Women's Mental Health*, 12, 193-201.
- Kuhn, E., Blanchard, E. B., & Hickling, E. J. (2003). Posttraumatic stress disorder and psychosocial functioning within two samples of MVA survivors. *Behavior Research and Therapy*, 41, 1105-1112.
- Laursen, M., Hedegaard, M., & Johansen, C. (2008). Fear of childbirth: predictors and temporal changes among nulliparous women in the Danish National Birth Cohort. *British Journal of Obstetrics and Gynaecology*, 115, 354-360.
- Laursen, M., Johansen, C., & Hedegaard, M. (2009). Fear of childbirth and risk for birth complications in nulliparous women in the Danish National Birth Cohort. *British Journal of Obstetrics and Gynaecology*, 116, 1350-1355.
- Lavender, T., & Walkinshaw, S. (1998). Can midwives reduce postpartum psychological morbidity? A randomized trial. *Birth*, 25, 215-219.
- Lemola, S., Stadlmayr, W., & Grob, A. (2007). Maternal adjustment five months after birth: The impact of the subjective experience of childbirth and emotional support from the partner. *Journal of Reproductive and Infant Psychology*, 25, 190-202.
- Lev-Wiesel, R., & Daphna-Tekoah, S. The role of peripartum dissociation as a predictor of posttraumatic stress symptoms following childbirth in israeli jewish women. *Journal of Trauma and Dissociation*, 11, 266-283.
- Lev-Wiesel, R., Daphna-Tekoah, S., & Hallak, M. (2009). Childhood sexual abuse as a predictor of birth-related posttraumatic stress and postpartum posttraumatic stress. *Child Abuse and Neglect*, 33, 877-887.
- Lyons, S. (1998). A prospective study of posttraumatic stress symptoms 1 month following childbirth in a group of 42 first-time mothers. *Journal of Reproductive and Infant Psychology*, 16, 91-105.
- MacLean, L., McDermott, M., & May, C. (2000). Method of delivery and subjective distress: women's emotional responses to childbirth practices. *Journal of Reproductive and Infant Psychology*, 18, 153-162.
- Maggioni, C., Margola, D., & Filippi, F. (2006). PTSD, risk factors, and expectations among women having a baby: A two-wave longitudinal study. *Journal of Psychosomatic Obstetrics and Gynecology*, 27, 81-90.
- McNally, R. J. (2003). Progress and controversy in the study of posttraumatic stress disorder. *Annual Review of Psychology*, 54, 229-252.
- Meades, R., Pond, C., Ayers, S., & Warren, F. (2011). Postnatal debriefing: Have we thrown the baby out with the bath water? *Behaviour Research and Therapy*, 49, 367-372.
- Morland, L., Goebert, D., Onoye, J., Frattarelli, L., Derauf, C., Herbst, M., et al. (2007). Posttraumatic stress disorder and pregnancy health: preliminary update and implications. *Psychosomatics*, 48, 304-308.

- National Comorbidity Survey – Replication (2005). NCS-R lifetime prevalence estimates Retrieved 1st August, 2012, from <http://www.hcp.med.harvard.edu/ncs/>
- National Institute for Health and Clinical Excellence. (2005). *Post-Traumatic Stress Disorder Clinical Guidelines*. London, UK: NICE.
- Navarro, P., Garc a-Esteve, L., Ascaso, C., Aguado, J., Gelabert, E., & Mart n-Santos, R. (2008). Non-psychotic psychiatric disorders after childbirth: Prevalence and comorbidity in a community sample. *Journal of Affective Disorders*, 109, 171-176.
- Nicholls, K., & Ayers, S. (2007). Childbirth-related post-traumatic stress disorder in couples: A qualitative study. *British Journal of Health Psychology*, 12, 491-509.
- Nieminen, K., Stephansson, O., & Ryding, E. L. (2009). Women's fear of childbirth and preference for cesarean section - A cross-sectional study at various stages of pregnancy in Sweden. *Acta Obstetrica et Gynecologica Scandinavica*, 88, 807-813.
- Nijenhuis, E. R. S., Van Engen, A., Kusters, I., & Van der Hart, O. (2001). Peritraumatic somatoform and psychological dissociation in relation to recall of childhood sexual abuse. *Journal of Trauma & Dissociation*, 2, 49-68.
- Olde, E., van der Hart, O., Kleber, R. J., van Son, M. J. M., Wijnen, H. A. A., & Pop, V. J. M. (2005). Peritraumatic dissociation and emotions as predictors of PTSD symptoms following childbirth. *Journal of Trauma and Dissociation*, 6, 125-142.
- Onoye, J M., Goebert, D., Morland, L., Matsu, C., & Wright, T. (2009). PTSD and postpartum mental health in a sample of Caucasian, Asian, and Pacific Islander women. *Archives of Women's Mental Health*, 12, 393-400.
- Ozer, E. J., Best, S. R., Lipsey, T. L., & Weiss, D. S. (2003). Predictors of posttraumatic stress disorder and symptoms in adults: A meta-analysis. *Psychological Bulletin*, 129, 52-73.
- Parfitt, Y. M., & Ayers, S. (2009). The effect of post-natal symptoms of post-traumatic stress and depression on the couple's relationship and parent-baby bond. *Journal of Reproductive and Infant Psychology*, 27, 127-142.
- Priest, S., Henderson, J., Evans, S. F., & Hagan, R. (2003). Stress debriefing after childbirth: a randomised controlled trial. *Medical Journal of Australia*, 178, 542-545.
- Quinnell, F. A., & Hynan, M. T. (1999). Convergent and discriminant validity of the perinatal PTSD questionnaire (PPQ): A preliminary study Source. *Journal of Traumatic Stress*, 12, 193-199.
- Reynolds, J. (1997). Posttraumatic stress disorder after childbirth: the phenomenon of traumatic birth. *Canadian Medical Association Journal*, 156, 831-835.
- Rose, S., Bisson, J., Churchill, R., & Wessely, S. (2002). Psychological debriefing for preventing post-traumatic stress disorder (PTSD). *Cochrane Database of Systematic Reviews*. doi:10.1002/14651858.CD000560
- Rothbaum, B. O., & Foa, E. B. (1993). Subtypes of posttraumatic stress disorder and duration of symptoms. In J. R. T. Davidson & E. B. Foa (Eds.), *Posttraumatic Stress Disorder: DSM-IV and beyond*. (pp. 23-35.). Washington: American Psychiatric Press.

- Rouhe, H., Salmela-Aro, K., Halmesmaki, E., & Saisto, T. (2009). Fear of childbirth according to parity, gestational age, and obstetric history. *BJOG: an International Journal of Obstetrics and Gynaecology*, 116, 67-73.
- Rowan, C., Bick, D., & da Silva Bastos, M. H. (2007). Postnatal debriefing interventions to prevent maternal mental health problems after birth: Exploring the gap between the evidence and UK policy and practice. *Worldviews on Evidence-Based Nursing*, 4, 97-105.
- Ryding, E. L. (1991). Psychosocial indications for cesarean section: A retrospective study of 43 cases. *Acta Obstetrica et Gynecologica Scandinavica*, 70, 47-49.
- Selkirk, R., McLaren, S., Ollerenshaw, A., McLachlan, A. J., & Moten, J. (2006). The longitudinal effects of midwife-led postnatal debriefing on the psychological health of mothers. *Journal of Reproductive and Infant Psychology*, 24, 133-147.
- Selye, H. (1956). *The Stress of Life*. New York: McGraw-Hill.
- Seng, J. S. (2002). A conceptual framework for research on lifetime violence, posttraumatic stress, and childbearing. *Journal of Midwifery and Women's Health*, 47, 337-346.
- Seng, J. S., Low, L. K., Ben-Ami, D., & Liberzon, I. (2005). Cortisol level and perinatal outcome in pregnant women with posttraumatic stress disorder: A pilot study. *Journal of Midwifery and Women's Health*, 50, 392-398.
- Seng, J. S., Low, L. K., Sperlich, M., Ronis, D. L., & Liberzon, I. (2009). Prevalence, trauma history, and risk for posttraumatic stress disorder among nulliparous women in maternity care. *Obstetrics and Gynecology*, 114, 839-847.
- Seng, J. S., Oakley, D. J., Sampselle, C. M., Killion, C., Graham-Bermann, S., & Liberzon, I. (2001). Posttraumatic stress disorder and pregnancy complications. *Obstetrics and Gynecology*, 97, 17-22.
- Seng, J. S., Sperlich, M., & Low, L. K. (2008). Mental health, demographic, and risk behavior profiles of pregnant survivors of childhood and adult abuse. *Journal of Midwifery and Women's Health*, 53, 511-521.
- Sebire, N. J., Jolly, M., Harris, J. P., Wadsworth, J., Joffe, M., Beard, R. W., Regan, L., & Robinson, S. (2001). Maternal obesity and pregnancy outcome: a study of 287,213 pregnancies in London. *International Journal of Obesity and Related Metabolic Disorders : Journal of the International Association for the Study of Obesity*, 25, 1175-1182.
- Slade, P. (2006). Towards a conceptual framework for understanding post-traumatic stress symptoms following childbirth and implications for further research. *Journal of Psychosomatic Obstetrics and Gynecology*, 27, 99-105.
- Small, R., Lumley, J., & Toomey, L. (2006). Midwife led debriefing after operative birth: four to six year follow up of a randomised trial. *BioMedical Central*, 4, 1-9.
- Small, R., Lumley, J., Donohue, L., Potter, A., & Waldenstrom, U. (2000). Randomised controlled trial of midwife led debriefing to reduce maternal depression after operative delivery. *British Medical Journal*, 321, 1043-1047.

- Smith, M. V., Poschman, K., Cavaleri, M. A., Howell, H. B., & Yonkers, K. A. (2006). Symptoms of posttraumatic stress disorder in a community sample of low-income pregnant women. *American Journal of Psychiatry*, 163, 881-884.
- Soderquist, J., Wijma, B., & Wijma, K. (2006). The longitudinal course of post-traumatic stress after childbirth. *Journal of Psychosomatic Obstetrics and Gynecology*, 27, 113-119.
- Soderquist, J., Wijma, B., & Wijma, K. (2006). The longitudinal course of post-traumatic stress after childbirth. *Journal of Psychosomatic Obstetrics and Gynaecology*, 27, 113-119.
- Soderquist, J., Wijma, K., & Wijma, B. (2002). Traumatic stress after childbirth: the role of obstetric variables. *Journal of Psychosomatic Obstetrics and Gynecology*, 23, 31-39.
- Soderquist, Wijma, Thorbert, & Wijmad (2009). Risk factors in pregnancy for post-traumatic stress and depression after childbirth. *BJOG: an International Journal of Obstetrics and Gynaecology*, 116, 627-680.
- Soet, J. E., Brack, G. A., & Dilorio, C. (2003). Prevalence and predictors of women's experience of psychological trauma during childbirth. *Birth*, 30, 36-46.
- Spiegelberg Gardner, P. (2003). Previous traumatic birth: an impetus for requested caesarean birth. *Journal of Perinatal Education*, 12, 1-5.
- Steele, A. M., & Beadle, M. (2003). A survey of postnatal debriefing. *Journal of Advanced Nursing*, 43, 130-136.
- Stramrood, C. A. I., Huis In't Veld, E. M. J., van Pampus, M. G., Berger, L. W. A. R., Vingerhoets, A. J. J. M., Willibrord, C. M., Schultz, W., van den Berg, P. P., van Sonderen, E. L. P., & Paarlberg, K. M. (2010). Measuring posttraumatic stress following childbirth critical evaluation of instruments. *Journal of Psychosomatic Obstetrics and Gynaecology*, 31, 40-49.
- Talge, N. M., Neal, C., & Glover, V. (2007). Antenatal maternal stress and long term effects on child neurodevelopment: How and why? *Journal of Child Psychology and Psychiatry*, 48, 245-261.
- Turton, P., Evans, C., & Hughes, P. (2009). Long-term psychosocial sequelae of stillbirth: Phase II of a nested case-control cohort study. *Archives of Women's Mental Health*, 12, 35-41.
- Turton, P., Hughes, P., Evans, C. D. H., & Fainman, D. (2001). Incidence, correlates and predictors of post-traumatic stress disorder in the pregnancy after stillbirth. *British Journal of Psychiatry*, 178, 556-560.
- van den Berg, H. R., Mulder, E. J., & Glover, V. (2005). Antenatal maternal anxiety and stress and the neurobehavioural development of the fetus and child: Links and possible mechanisms. A review. *Neuroscience Biobehavioral Review*, 29, 237-258.
- Voges, M., & Romney, D. (2003). Risk and resiliency factors in posttraumatic stress disorder. *Annals of General Hospital Psychiatry*, 2, 4.

- Wang, S.-Y., Jiang, X.-Y., Jan, W.-C., & Chen, C.-H. (2003). A comparative study of postnatal depression and its predictors in Taiwan and mainland China. *American Journal of Obstetrics and Gynecology*, 189, 1407-1412.
- Watson, C. G., Juba, M. P., Manifold, V., Kucala, T., & Anderson, E. D. (1991). The PTSD interview: Rationale, description, reliability, and concurrent validity of a DSM-III based technique. *Journal of Clinical Psychology*, 47, 179-188.
- Wenzel, A., Haugen, E., Jackson, L., & Brendle, J. (2005). Anxiety symptoms and disorders at eight weeks postpartum. *Anxiety Disorders*, 19, 295-311.
- Wessely, S., & Deahl, M. (2003). In debate: psychological debriefing is a waste of time. *British Journal of Psychiatry*, 183, 12-14.
- White, G. (2007). You cope by breaking down in private: Fathers and PTSD following childbirth. *British Journal of Midwifery*, 15, 39-45.
- White, T., Matthey, S., Boyd, K., & Barnett, B. (2006). Postnatal depression and post-traumatic stress after childbirth: Prevalence, course and co-occurrence. *Journal of Reproductive and Infant Psychology*, 24, 107-120.
- Wijma, K., Soderquist, J., & Wijma, B. (1997). Posttraumatic stress disorder after childbirth: A cross sectional study. *Journal of Anxiety Disorders*, 11, 587-597.
- Wijma, Soderquist, & Wijma (1997). Posttraumatic stress disorder after childbirth: A cross sectional study. *Journal of Anxiety Disorders*, 11, 587-597.
- Yehuda, R. (2001). Biology of posttraumatic stress disorder. *Journal of Clinical Psychiatry*, 62, 41-46.
- Zar, M., Wijma, K., & Wijma, B. (2002). Relations between anxiety disorders and fear of childbirth during late pregnancy. *Clinical Psychology and Psychotherapy*, 9, 122-130.

Figure 1. Etiological model of postpartum PTSD (adapted from Ayers, 2004)

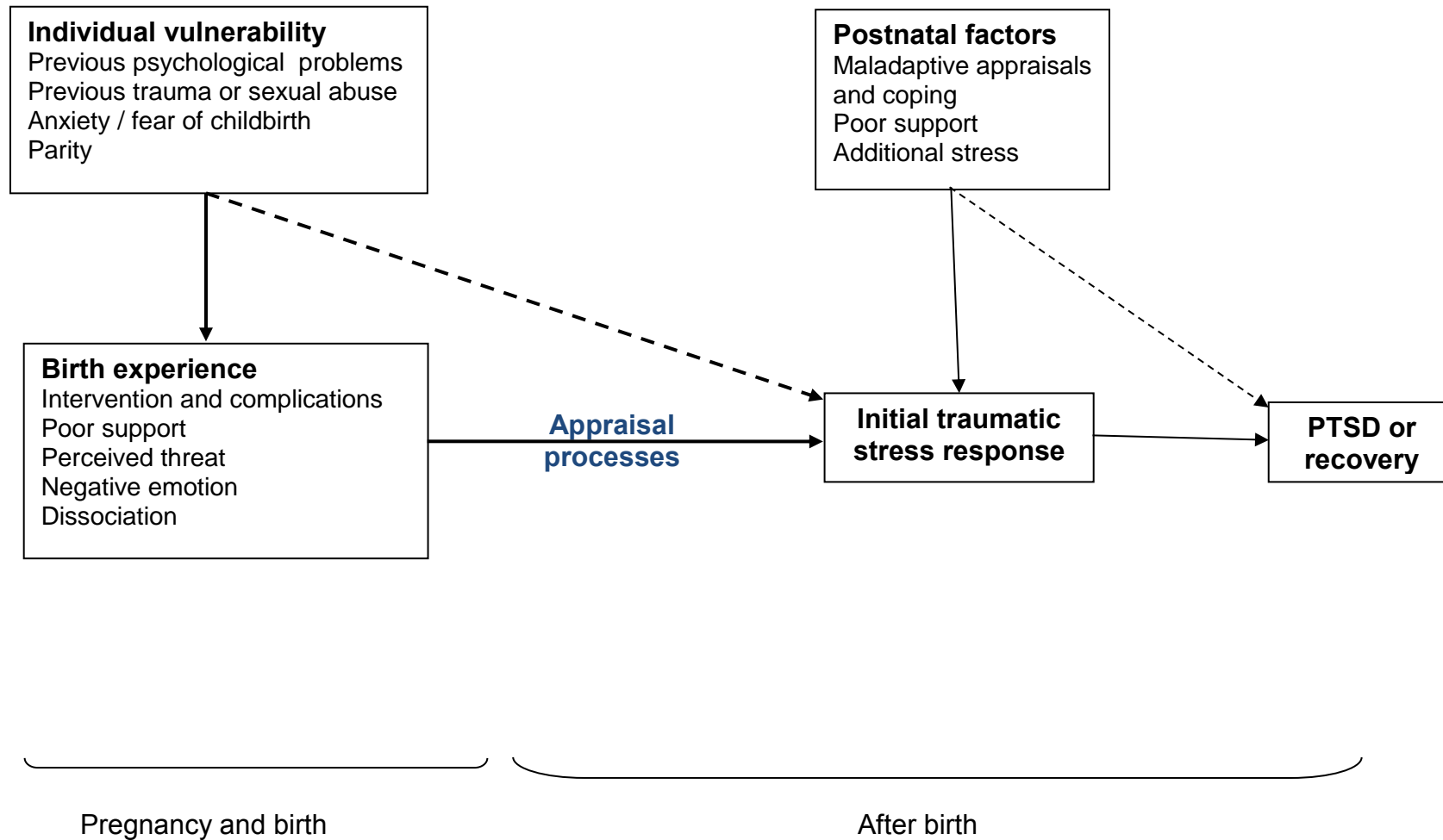


Figure 2. Potential prevention and intervention strategies

