



## Review article

# Maternal posttraumatic stress disorder during the perinatal period and child outcomes: A systematic review



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## ABSTRACT

**Background:** Approximately 3.3% of women in pregnancy have posttraumatic stress disorder (PTSD) and 4% of women postpartum PTSD. The impact of maternal PTSD during the perinatal period (from conception until one year postpartum) on child outcomes has not been systematically examined.

**Method:** A systematic review was conducted to synthesize and critically evaluate quantitative research investigating the association between perinatal PTSD and child outcomes. Databases EMBASE, BNI, Medline, PsycInfo and CINAHL were searched using specific inclusion and exclusion criteria.

**Results:** 26 papers reporting 21 studies were identified that examined associations between perinatal PTSD and postpartum birth outcomes, child development, and mother-infant relationship. Studies reviewed were heterogeneous, with poor-to-medium scores of methodological quality. Results showed that maternal postpartum PTSD is associated with low birth weight and lower rates of breastfeeding. Evidence for an association between maternal PTSD and preterm birth, fetal growth, head circumference, mother-infant interaction, the mother-infant relationship or child development is contradictory. Associations between maternal PTSD and infant salivary cortisol levels, and eating/sleeping difficulties are based on single studies, so require replication.

**Limitations:** Methodological weaknesses of the studies included insufficient sample size, use of invalidated measures, and limited external validity.

**Conclusion:** Findings suggest that perinatal PTSD is linked with some negative child outcomes. Early screening for PTSD during the perinatal period may be advisable and onward referral for effective treatment, if appropriate. Future research using larger sample sizes, validated and reliable clinical interviews to assess PTSD, and validated measures to assess a range of child outcomes, is needed.

## 1. Introduction

Childbirth is a complex, sometimes traumatic, event that can pose a threat to the life of the mother and/or her child (Olde et al., 2006), leading to the development of posttraumatic stress disorder (PTSD). Posttraumatic stress disorder consists of four sets of symptom clusters (intrusion or re-experiencing; avoidance; negative alterations in mood or cognitions, and increased arousal), which must have lasted for at least one month, and significantly impair their functioning (American Psychiatric Association, 2013). Individuals must have been exposed to actual or threatened death, serious injury, or sexual violence. This exposure can be direct, witnessed, indirect (e.g., by hearing of a relative or close friend who has experienced the event), or repeated or extreme indirect exposure (American Psychiatric Association, 2013).

Women can have PTSD in the perinatal period, defined as extending

from when pregnancy begins, up to one year following childbirth (McKenzie-McHarg et al., 2015). A recent systematic review and meta-analysis of PTSD reported prevalence rates of 3.3% during pregnancy and a further 4% of postpartum PTSD, mostly in relation to traumatic events during birth (Yildiz et al., 2017). Prevalence is greater in high-risk samples, such as women who have severe complications in pregnancy or during childbirth, with rates of 15–18% (Grekin and O'Hara, 2014; Horsch et al., 2013; Yildiz et al., 2017), after premature birth (e.g., Horsch et al., 2015a, 2015b), after emergency cesarean section (e.g., Horsch et al., 2017) or after stillbirth (e.g., Horsch et al., 2015a, 2015b). However, it is likely that most studies underestimate the total prevalence of PTSD in the postpartum period by only examining PTSD related to traumatic childbirth experiences (Yildiz et al., 2017).

Posttraumatic stress disorder in pregnant women has been studied to an even lesser extent than PTSD in the postpartum period. On

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average, the prevalence of PTSD during pregnancy is 3.3% in community samples and 18% in high risk samples (Yildiz et al., 2017), with higher rates in high risk samples. For example, one study found that 69% of pregnant women in a convenience sample had experienced a violent traumatic event (mostly interpersonal violence); 58% of this sample met diagnostic criteria for PTSD (Harris-Britt et al., 2004).

Although PTSD occurring at any time is of concern, experiencing such symptoms during pregnancy can pose additional difficulties, as it may increase the risk for pregnancy complications and negative birth outcomes. For example, PTSD during pregnancy has been linked to neuroendocrine alterations, such as the dysregulation of cortisol, vasopressin, and oxytocin, which may directly predispose women to birth complications (Friedman and McEwen, 2003; Marshall and Garakani, 2002). This may also predispose infants to a biological vulnerability to PTSD (Yehuda et al., 2005). Furthermore, PTSD is associated with high rates of psychiatric comorbidities (Keane and Kaloupek, 1997), including anxiety and depression, which may also increase risks for pre-term delivery, low birth weight, and reduced fetal growth (Morland et al., 2007).

Various factors make women susceptible to developing PTSD following childbirth. A recent meta-analysis of risk factors found that negative subjective birth experiences, having an operative birth, lack of support, and dissociation were associated with postpartum PTSD and depression (Ayers et al., 2016). Evidence suggests that other factors might also be important, such as the baby's gender, level of social support following childbirth, history of mental health problems, and stressful life events (Creedy et al., 2000; Ford and Ayers, 2011; Grekin and O'Hara, 2014; Iles et al., 2011; Soderquist et al., 2006; Tamaki et al., 1997). In addition, cognitive behavioral factors, such as the nature of the trauma memory, negative cognitive appraisals, and safety behaviors may also contribute to the development of PTSD following childbirth (Ford et al., 2010; King et al., 2017; Vossbeck-Elsebusch et al., 2014).

A few studies have highlighted the impact that postpartum PTSD may have on child development. Child development can be understood as a dynamic and ongoing process that is influenced by a complex network of biological, psychological, and social factors (Staudinger and Lindenberger, 2003). The lifespan perspective assumes that development is lifelong, multi-dimensional and multi-directional, highly plastic, and affected by multiple interacting forces (Staudinger and Lindenberger, 2003). Events occurring during each major period of child development, from prenatal to adolescence, can have powerful effects on future change. These changes can occur across multiple domains (including physical, cognitive, emotional, and social), and the challenges and adjustments to this development can be affected by a complex combination of any multitude of these factors (Berk, 2007). As a result, inequalities in health, cognitive development, and socio-emotional functioning can emerge in early life, highlighting the importance of early intervention in promoting optimal well-being for the child and their family system (Doyle et al., 2009).

Even from the earliest stages of life, environmental factors, such as poor maternal nutrition and substance use, can have a profound influence on fetal and child development, including cognitive and behavioral impairment, as well as adverse fetal outcomes (Langley-Evans, 2006; Fifer and Moon, 2007). In turn, adverse fetal outcomes, such as low birth weight, are correlated to deficits in academic achievement, attentional problems, and internalizing behavioral problems (Aarnoudse-Moens et al., 2009). Additionally, not being breastfed is associated with an increased incidence of infectious morbidity in infants, as well as elevated risks of childhood obesity, and sudden infant death syndrome (Stuebe, 2009).

Attachment theory highlights the importance of relational patterns within the first two years of life, as experiencing a sensitive and responsive interaction with a caregiver is considered essential for the development of an infant's secure attachment (Bowlby, 1973). Insecure attachment had been found to be a risk factor for a range of later social

and cognitive difficulties; parental mental health problems can directly contribute to this, as they are often linked with disrupted patterns of interaction with their child (Madigan et al., 2006). However, research has also suggested that early attachment does not necessarily predict attachment later in development (Groh et al., 2014).

Mounting evidence suggests that postpartum PTSD may impact on the mother-infant relationship, as well as infant behavior and cognitive development (Ayers et al., 2006; Creedy et al., 2000; Paykel, 2003; Shaw et al., 2009; Soderquist et al., 2006). For example, a large longitudinal study of 1472 women found maternal postpartum PTSD symptoms eight weeks after birth were associated with poor social-emotional development at two years, particularly in boys and children with an early difficult temperament (Garthus-Niegel et al., 2017).

Whilst a reasonable amount of research has been conducted investigating the role of risk factors in the development of PTSD in women during both the antenatal and postpartum period, there is less research examining the impact of PTSD during the perinatal period on child outcomes. Nevertheless, PTSD may be an important underlying mechanism for understanding perinatal health, birth complications, and birth outcomes, both through the associated negative behaviors that women may display, and also through a more direct association with neuroendocrine pathways. Morland et al. (2007) suggest that PTSD can affect maternal and fetal health directly (e.g., through immunologic and endocrine factors), or via maladaptive responses (e.g., anxiety, depression, somatization), which can also contribute to negative health behaviors (such as smoking, substance abuse, or overeating to soothe the emotional discomfort, possibly leading to obesity).

This review aimed to systematically review and summarize research investigating the association between maternal PTSD during the perinatal period (beginning of pregnancy until first year postpartum) and child outcomes. Child outcomes are grouped into postpartum birth outcomes, child development, and mother-infant relationship.

## 2. Method

### 2.1. Search strategy

Studies were identified by systematically searching the following databases: EMBASE, BNI, Medline, PsycInfo and CINAHL. Search terms were grouped under three main headings: perinatal-related; posttraumatic stress disorder-related; and child outcome-related. These search terms were combined (see Appendix A for complete search strategy). Searches were restricted to peer-reviewed articles published in English between 1980 and March 2016.

Inclusion criteria were: report of primary research; samples of women, or a separate report of women's results; data was collected during the perinatal period (from pregnancy to one year postpartum); report of PTSD symptoms and/or diagnosis during the perinatal period, which was measured using a questionnaire, interview, or clinical code. Papers had to also include child outcomes and examine the association between these and maternal PTSD. Studies were excluded if women's findings were not reported separately, or if there was no assessment of perinatal PTSD symptoms. Furthermore, if co-morbid conditions were described, PTSD needed to be reported separately from other comorbid conditions.

The initial search identified 357 articles. Seventy-one duplicates were removed, and the remaining articles were screened for suitability in accordance with inclusion criteria. Secondary searches involved scanning publication reference lists, accessing online citations, and manual searches of relevant journals. Experts in the field and primary authors were contacted for access to further publications. An additional 18 articles were identified through secondary searches, totaling 304 articles. This resulted in 50 articles undergoing full-text review, and 26 original articles meeting all the above criteria (see Fig. 1).

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