Trauma, Stress, and Post-Traumatic Stress Disorder (PTSD) in Perinatal Period

Nora L. Erickson, Diana Morelen, and Maria Muzik ⓘD

Stress is a universal experience and an adaptive reaction to *stressors* (i.e., the causes or sources of stress), wherein the environmental, physical, or emotional demands exceed an individual's resources, yielding a reactive and involuntary cascade of physiological and bodily responses. Although the term "stress" encompasses a range of positive and negative experiences, an individual's acute stress response (e.g., secretion of adrenal hormones, increased heart rate and respiration) is typically transient, and the body returns to baseline homeostasis after a stressor is removed. Nevertheless, certain stressors may disrupt or recalibrate the body's stress response, resulting in persistent or maladaptive stress reactivity that continues even after the original threat is no longer present. Such dysregulation of the body's stress response is likely to occur when stressors are prolonged and uncontrollable in nature, commonly referred to as *chronic stress* [1] or *toxic stress* [2]. As a related construct, *trauma* is a specific and extreme stressor, defined as disturbing events or experiences involving actual or perceived threat of death, injury, or bodily harm [3, 4]. Traumatic stress inherently overwhelms an individual's coping mechanisms [5] and may yield lasting effects on psychological, relational, and physical health. When the traumatic experiences are interpersonal in nature (e.g., inflicted by a

N. L. Erickson
Department of Pediatrics, University of Minnesota, Minneapolis, MN, USA
e-mail: eric4350@umn.edu

D. Morelen
Department of Psychology, East Tennessee State University, Johnson City, TN, USA
e-mail: morelen@etsu.edu

M. Muzik (✉)
Department of Psychiatry, University of Michigan-Michigan Medicine, Ann Arbor, MI, USA
e-mail: muzik@med.umich.edu

caregiver or romantic partner) and occur early in development (i.e., during the first decade of life; [6]), trauma can have especially deleterious consequences.

In the context of current or lifetime trauma, the perinatal period may be a time of increased risk for the initial onset, recurrence, and exacerbation of post-traumatic stress symptoms and other psychopathology [7–9]. For example, risks for perinatal mental health concerns are particularly high for women with a history of reproductive trauma and childhood sexual abuse, given the psychosexual changes associated with pregnancy and prenatal care procedures that may be perceived as invasive and triggering [10–12]. Furthermore, although childbirth in and of itself is not traumatic, birth trauma and childbirth-related post-traumatic stress disorder can occur following subjective appraisals of actual or threatened death, injury, or bodily harm to the mother or child [13–15]. Overall, the physical and psychological effects of trauma may detrimentally impact a birthing person's health and behavior during pregnancy; delivery and birth outcomes; postpartum mental health and maternal functioning; and the developing parent-child relationship.

Identifying risks for perinatal traumatic stress and minimizing its detrimental effects is especially important, given that pregnancy and postpartum inherently overlap with sensitive periods of child brain development. The intergenerational transmission of trauma and stress can occur through unique and combined genetic, epigenetic, parenting, and environmental mechanisms, which can translate into neuroendocrine and neuroanatomical changes in offspring, thereby altering behavior and development across the life span [1, 16, 17]. As such, a mother's well-being during the perinatal period has significant implications for her own physical and mental health *as well as* the health and well-being of her offspring.

In the current chapter, we focus on trauma, stress, and post-traumatic stress symptoms during pregnancy and postpartum. We begin the chapter with a general overview of trauma effects on the individual, briefly highlighting common physiological and psychological outcomes. Next, we provide an overview of three specific types of traumatic stress and their effects on pregnant and postpartum women: birth trauma, childhood maltreatment, and the COVID-19 pandemic. Finally, we end with a discussion of assessment and treatment options for birthing people with a history of trauma and stress, focusing on the importance of timely screening and effective treatments for both individuals and caregiver-infant dyads, which may help mitigate the intergenerational transmission of trauma and toxic stress.

10.1 Physical and Psychological Trauma Effects

Individual reactions to traumatic events fall on a continuum, from resilient and adaptive responses to significant psychiatric distress and poor functioning. Although the vast majority of people who experience trauma do not develop significant or ongoing psychological sequelae, trauma can detrimentally alter an individual's beliefs, functioning, and interpersonal behavior [1, 18, 19]. Even when individuals do not experience trauma-related mental health symptoms or consciously recall what happened to them, trauma may leave a physiological imprint on the brain and

the body. For example, childhood abuse and maltreatment can alter brain pathways involved in stress regulation (e.g., the hypothalamic pituitary adrenal axis), as well as connectivity between regions crucial to emotional health (e.g., the limbic system and medial prefrontal cortex; for review, see [20]). Furthermore, cumulative adverse childhood experiences or "ACEs" substantially increase risk for adult-onset disease, including cancer, cardiovascular, metabolic, gastrointestinal, and other inflammatory diseases [21–24]. This link between traumatic stress and health outcomes is critically important in the perinatal period, as both proximal and distal stressors can impact pregnancy and birth outcomes, including hypertension, impaired uterine blood flow, preterm birth, and low birth weight [25–32].

Based on a combination of retrospective and prospective research, trauma exposure is consistently associated with increased risk for negative mental health outcomes, including post-traumatic stress disorder (PTSD), depression, anxiety disorders, substance use disorders, and more generalized emotion dysregulation. And yet, many of the symptoms associated with such psychological "dysfunction" may have been protective in the context of ongoing trauma, wherein the individual developed responses or behaviors to actively cope with the stress or prevent further harm [19]. From a strengths-based and trauma-informed perspective, we therefore acknowledge that current diagnostic systems may pathologize behavior and functioning that once served an adaptive role in the face of trauma [33, 34].

Despite the variety of psychological responses that may emerge secondary to traumatic stress, in this chapter we primarily highlight and focus on perinatal PTSD. In order to meet criteria for PTSD, individuals must identify a criterion traumatic event and endorse a combination of symptoms that include re-experiencing (e.g., flashbacks or intrusive memories), avoidance of trauma reminders, negative changes in mood/cognition, and increased arousal or activation in response to trauma-related stimuli [35]. In the perinatal period, estimated prevalence rates for PTSD vary widely depending on the period of assessment, measurement methods, and sample type. Within an urban and racially diverse pregnant sample, Seng et al. [11] found the risk of developing PTSD during pregnancy was six times higher among individuals with demographic risk factors (e.g., younger age, poverty, less than high school education) and those with a history of prior miscarriage or terminated pregnancy. Consistent with the broader obstetric literature on racial differences in perinatal outcomes (see, e.g., American College of Obstetricians and Gynecologists [36] and Hardeman et al. [37]), one study among pregnant women in the United States found Black women were slightly more likely to have higher rates of lifetime PTSD, but had four times the rate of concurrent PTSD during pregnancy [38, 39]. Unfortunately, other studies have reported perinatal women with combined demographic risk and PTSD symptoms are also more likely to have comorbid psychopathology, including a fivefold increase in risk for major depressive disorder and threefold risk for generalized anxiety disorder [40].

In two separate meta-analytic investigations, substantial differences in PTSD prevalence emerged when comparing high-risk perinatal women to community samples [41, 42]. Of note, high-risk groups in both studies included individuals with psychological risk factors (e.g., history of sexual violence, childhood abuse, high

fear of giving birth, prior birth trauma), as well as individuals with notable medical risks for the mother or fetus (e.g., preeclampsia, prior preterm birth or emergency caesarean, identified fetal anomalies). Grekin and O'Hara [41] found a PTSD prevalence of 3.1% in community samples but 15.7% in high-risk samples. More recently, Yildiz et al. [42] showed a similar postpartum PTSD prevalence of 4.0% in community samples but 18.5% in high-risk samples. One novel aspect of Yildiz et al.'s [42] meta-analysis was the focus on PTSD prevalence during pregnancy *and* postpartum. Once again, a stark differential risk pattern emerged in pregnancy: the prevalence of prenatal PTSD was 3.3% in community samples and 18.95% in high-risk samples. Across both pregnancy and postpartum, Yildiz et al. [42] found the course of perinatal PTSD was generally characterized by increases in PTSD prevalence during the first 6 months after birth. Although prospective longitudinal studies of perinatal PTSD are somewhat limited (see, e.g., [43]), it is possible that the higher point prevalence in the immediate postpartum period may relate to acute birth trauma or childbirth experiences that are re-traumatizing for women with prior trauma or a history of PTSD [42].

Looking more closely at risk for postpartum PTSD, symptoms typically occur via two etiological patterns: (1) a continuation, exacerbation, or recurrence of PTSD symptoms in the context of more general trauma history and (2) new-onset PTSD symptoms triggered specifically by childbirth experiences [41, 44–46]. In the former group, postpartum PTSD symptoms emerge or *re*-emerge secondary to lifetime events that occurred prior to birth, pregnancy, or even conception, including criterion stressors such as childhood sexual abuse, rape, or intimate partner violence [41, 45]. Within the latter group, wherein childbirth itself is the traumatic event, PTSD symptoms emerge secondary to distressing labor and delivery experiences [41, 42, 44, 46–48]. In the next sections, we further elaborate on birth trauma and two other types of traumatic stress (i.e., childhood maltreatment and the COVID-19 pandemic), exploring ways in which these traumatic and stressful experiences may detrimentally impact perinatal women's mental and physical health, birth outcomes, and the developing parent-child relationship.

10.2   Birth Trauma and Childbirth-Related PTSD

Historically, studies of postpartum PTSD have not consistently distinguished childbirth-related PTSD (i.e., CB-PTSD) from more general postpartum PTSD precipitated by lifetime traumatic events; however, the study of birth trauma and risk for CB-PTSD is a growing field [42, 44, 47, 49]. Objectively, labor and delivery involve acute physiological changes, from drastic hormonal shifts to extreme bodily pain, changes in cardiac and respiratory output, and blood loss. Although the majority of birthing people do not develop PTSD following childbirth, given the complexity of labor and delivery, it is perhaps unsurprising that even full-term, healthy births may be experienced as stressful or traumatic [44, 50]. Using established PTSD criteria (APA 2013), childbirth can be characterized as a criterion traumatic event when there is actual *or* threatened death or bodily harm to the mother or neonate.

Based on data from phenomenological interviews among women with a history of birth trauma [51], further expanded this definition of birth trauma to include traumatic experiences in which women feel dehumanized or stripped of their dignity during labor and delivery.

Consistent with PTSD in the general population [52, 53], *subjective* appraisals of traumatic birth experiences are a strong predictor of CB-PTSD [54–56]. Notably, women's birth appraisals may substantially differ from the perceptions of obstetricians and other clinical staff, who may otherwise deem certain birth-related medical events and procedures as "routine" [49]. The prevalence of CB-PTSD among birthing people who describe their labor and delivery as traumatic varies widely across prior studies, ranging from 9% to 44% [57]. In the United States, Black, Indigenous, People of Color (BIPOC) are more likely to report mistreatment during labor and delivery [58], including behaviors frequently associated with traumatic birth appraisals, such as loss of autonomy and being ignored by providers. As noted, however, only a minority of women who identify their birth experiences as traumatic go on to develop clinically significant CB-PTSD. In a study of CB-PTSD, Alcorn et al. [59] found 43% of the sample subjectively described childbirth as a trauma event; however, only 3.6% developed clinically significant postpartum PTSD. In a prospective, longitudinal, observational study, Kountanis et al. [60] recently reported rates of new-onset CB-PTSD at 6 weeks and 3 months postpartum of 6.2% and 5.1%, respectively. In comparison, when considering subclinical symptoms (e.g., hyperarousal, re-experiencing, avoidance), another study found up to one third of first-time mothers experience some form of post-traumatic stress symptoms secondary to childbirth [61].

When identifying and differentiating individuals who go on to develop CB-PTSD from those who do not experience post-traumatic stress symptoms, attention must be paid to interactive and multifaceted risk factors. The emergence of CB-PTSD is often conceptualized within a diathesis-stress model, wherein a combination of prebirth vulnerability factors and birth-specific risk factors predicts negative outcomes [44, 62]. In a meta-analysis exploring the etiology of CB-PTSD, Ayers et al. [47] reported the *vulnerability factors* most strongly associated with CB-PTSD were a prior history of trauma and PTSD; depression during pregnancy; fear of childbirth; and health complications during pregnancy. The birth-related *risk factors* most strongly associated with CB-PTSD included negative subjective appraisals of birth; dissociation during labor and delivery; having an operative delivery (i.e., assisted vaginal or caesarean); and poor support during birth [47]. Overall, these results are highly consistent with more general (i.e., not childbirth-specific) risks for postpartum PTSD [41]. Qualitative and interview-based data further highlight higher risk for birth trauma associated with perceptions of low control and poor communication during labor and delivery; across multiple studies, traumatic birth experiences are often characterized by limited information from medical staff about what is occurring, lack of consent, and not involving women in medical decision-making [49, 57, 63]. In particular, Beck [64] identified risk for traumatic birth when women have low feelings of self-agency combined with the perception that medical procedures were "acted on" them. Additional experiences common to traumatic birth may

include feeling abandoned or alone during labor and delivery; limited or poor-quality birthing support (e.g., from partners, doulas); and discrepancies between birth expectations and reality [49, 57, 63].

Similar to the broader PTSD literature, there is also a strong association between CB-PTSD and perinatal depression [41, 47], with moderate to high rates of comorbidity [65]. For example, as many as 72% of women with postpartum PTSD may endorse clinically significant depressive symptoms [42]. Given the degree of comorbidity, Dekel et al. [65] recently explored whether CB-PTSD and postpartum depression may actually represent a "single posttraumatic stress-depressive response" (p. 562). Within their sample, the authors found 90% of women classified with CB-PTSD had elevated levels of depression, whereas 31% of those with postpartum depression had comorbid symptoms of CB-PTSD. Factor-analytic results further supported a one-factor model, even after controlling for overlapping symptoms within CB-PTSD and depression diagnostic criteria [65]. Given these results, Dekel et al. [65] concluded that a distinct subset of women may develop a unique depression-stress phenotype secondary to traumatic childbirth, and when this is the case, it is critical for effective treatments to address the depressive symptoms in the context of comorbid post-traumatic stress and the underlying traumatic event.

Birth trauma and CB-PTSD may also pose unique intergenerational challenges to offspring development and the early parent-child relationship. Although up to one quarter of women may develop CB-PTSD in the context of a healthy full-term birth [44], Grekin and O'Hara found a strong relationship between infant complications (e.g., low birth weight, preterm birth, NICU stay) and PTSD among high-risk postpartum samples. Thus, some mothers may be faced with the dual challenges of attending to their child's medical and developmental complications while also managing their own postpartum PTSD symptoms. Within the growing literature on motherhood and parenting outcomes among women with postpartum PTSD, only a select number of studies have focused on mothers with CB-PTSD. Ostensibly, given that the criterion trauma in CB-PTSD involves the birth of the child, one might expect difficulties with maternal bonding or connecting with the infant. Prior findings indicate that mothers with CB-PTSD describe their 6-week-old newborns as less emotionally warm and more demanding [66]; rate their 18-month-old children higher in internalizing and externalizing disorders [67]; and self-report interactions with their 24-month-old toddlers as difficult [68]. Among a relatively large sample of 685 postpartum women, Dekel et al. [69] compared subgroups of mothers with probable CB-PTSD, those with postpartum PTSD unrelated to birth trauma, and those with no PTSD symptoms. The authors found that the CB-PTSD group had the poorest self-reported ratings of mother-to-infant attachment, even after controlling for other demographic, psychiatric, and childbirth-related confounds (e.g., parity, type of delivery, NICU admission; [69]). In one of the few qualitative studies examining the parenting experiences of women with CB-PTSD, Beck and Watson [70] identified phenomenological parenting themes of numbness/detachment, high reactivity (i.e., anger, crying), distressing cognitive changes (e.g., catastrophic thinking), and limited social interactions outside the home. Overall, these findings underscore the potential intergenerational impact of birth trauma and CB-PTSD,

with parent-child interactions representing an important behavioral target for intervention among high-risk dyads. In the next section, we will expand our focus on the risk factors and consequences of perinatal traumatic stress by examining how a mother's history of maltreatment in her own childhood may impact birth outcomes, perinatal mental health, and parenting practices.

10.3   Childhood Maltreatment

Although the perinatal period is generally a time of heightened vulnerability for physical and mental health challenges, such risks are significantly heightened for individuals with childhood maltreatment histories [71–73]. Childhood maltreatment (CM) is defined as "…all types of physical and/or emotional ill-treatment, sexual abuse, neglect, negligence, and commercial or other exploitation, which results in actual or potential harm to the child's health, survival, development or dignity in the context of a relationship of responsibility, trust or power" [74]. Though prevalence rates vary by definition and population, 61% of adults report at least one adverse childhood experience prior to the age of 18 (e.g., abuse, neglect, household dysfunction; [75]); and globally, approximately 20% of women report experiences of childhood sexual abuse [76]. Among women in the perinatal period, prevalence rates of CM range from 11% to 35% in community samples [77] and 47% to 80% among higher-risk mothers (e.g., teen mothers, low-income mothers [78, 79]).

It is well established that a history of CM puts women at greater risk for physiological and psychological disruptions during pregnancy [16, 38, 39, 71]. Broadly speaking, women with CM histories have heightened risk for antenatal complications such as premature contractions, cervical insufficiency, gestational diabetes, previa, abruption, preeclampsia, intrauterine growth restriction, being of overweight status, and/or being hospitalized during pregnancy [38, 39, 80, 81]. Some of the physiological disruptions associated with CM histories may help explain the greater risk for health complications during pregnancy. For example, women with CM histories have greater risk for thyroid dysfunction and subclinical hypothyroidism during pregnancy [82], as well as higher levels of placental corticotropin-releasing hormone (pCRH) and a steeper increase in release of pCRH [83]. The association between CM history and mental health symptoms is also well-replicated in the perinatal period. A systemic review that included research with over 26,000 participants found that CM is strongly associated with a greater risk for depression and PTSD during pregnancy and postpartum, even when controlling for history of mental illness, sociodemographic variables, and psychosocial factors [71].

The combination of CM history and perinatal psychopathology may be particularly detrimental to birth outcomes and child development. For example, in the context of CM and maternal PTSD symptoms, risks for low birth weight and shorter gestation are heightened [38, 39], as are risks for breastfeeding challenges and bonding impairment [8, 9]. Consistent with the idea of intergenerational transmission of risk, offspring of women with CM histories may be at greater risk for subsequent mental and physical health challenges [16, 43, 83]. More specifically,

endocrine and immune processes play an essential role in fetal development, and disruptions to these neurobiological processes may partially explain the transmission of risk from maternal CM history to negative neurodevelopmental outcomes among children [16, 82–85]. For example, Moog et al. [85] found newborns of mothers with CM histories had smaller brain size and gray matter volume at birth compared to newborns of mothers who did not have a history of CM. Further, research suggests there is a dose-dependent effect of CM, such that worse severity (i.e., frequency/intensity) is associated with worse offspring outcomes [16]. In sum, CM has the potential to impact maternal physical and psychological well-being during the perinatal period, and in turn, these maternal changes can influence intrauterine development in profound ways.

Nevertheless, the impact of CM on perinatal risk is probabilistic rather than deterministic, and processes of risk and resilience are complex and multifaceted. Although it is well known that postpartum depression increases risk for parenting difficulties—and subsequent child biopsychosocial outcomes [86–89]—research on the unique impact of CM and/or postpartum PTSD symptoms on parenting outcomes has a less consistent and clear picture [90, 91]. For example, although mothers with CM histories may perceive themselves as being less confident or competent in parenting, these perceptions are not always associated with observed challenges in parenting behaviors [92]. Further, prior observational research documented that CM history *in the absence of psychopathology* did not confer risk for negative parenting behaviors [91], nor was CM history associated with maternal parenting behaviors or reflective functioning [93]. In another study, mothers with CM histories reported higher bonding impairment with their infants than mothers without CM histories, but the persistence of bonding problems across the postpartum period was predicted by psychological symptoms rather than CM status [72].

One way to help make sense of the contradictory results around CM and parenting is to think about the numerous risk and protective factors across the mother's own developmental trajectory [71], as well as the complexity of the post-traumatic changes that may emerge as a mother transitions into parenthood [94]. In a study of CM survivors during the postpartum period, Fava et al. [94] found higher CM severity combined with higher demographic risk was associated with greater *positive* post-traumatic change (e.g., being intentional about protecting their child from abuse and staying calm in the face of challenging child behaviors because they want to give their child a better childhood than they experienced [94]). Thus, although CM history may increase risk for perinatal mental health difficulties, and these symptoms can in turn increase risk for parenting challenges, the pathway from CM to parenting is one marked by both risk and resilience. Ultimately, it is important to recognize that women with CM histories are very much capable of nurturing, safe, and effective parenting, despite what happened to them.

In the subsequent section, we will end our review of specific traumatic stressors and their effects on perinatal mental health by highlighting a far-reaching, once-in-a-century stressor that has detrimentally affected individuals and communities across the globe: the COVID-19 pandemic. We will specifically highlight unique

challenges facing perinatal women and explore the impact of the pandemic on increased risk for perinatal mental health concerns, including high levels of stress, depression, anxiety, and perinatal PTSD.

10.4   COVID-19 Pandemic

In 2020, the global coronavirus pandemic brought an accumulation of physical, psychological, and social stressors for much of the world population. Given the widespread and multifaceted consequences—including the threat of severe illness, death, or loss of a loved one—attention to the mental health impact of COVID-19 (i.e., the disease caused by SARS-CoV-2) among perinatal women is warranted. At the time of this chapter's publication, rapidly emerging data on pregnancy and birth outcomes associated with COVID-19 created a moving target of literature to review. Understanding the risks and consequences associated with prenatal COVID-19 infection was further complicated by difficulties separating the direct effects of the disease from indirect changes to maternity care and other social determinants of health [95], as well as challenges in identifying infected individuals given limited universal testing and indications that up to 90% of pregnant women infected with SARS-CoV-2 are asymptomatic [95, 96]. Nevertheless, several recent systematic reviews and meta-analyses indicate that prenatal COVID-19 infection is associated with heightened risk for preterm birth prior to 37 weeks [95, 97, 98], caesarean delivery [95, 98], and maternal intensive care unit admission [97]. These risks are particularly high for infected women of increased maternal age and those with pre-existing medical comorbidities [95, 97]. Thus far, risk of vertical transmission to the neonate appears rare [95, 98], although one review found higher risk of NICU admission among babies born to mothers with COVID-19 [97]. Taken together, the emerging data on COVID-19 appear somewhat contradictory insofar as positive pregnant women may present as asymptomatic *or* severely ill (e.g., requiring admission to intensive care unit), which ultimately heightens confusion among this population and adds to the rising mental health toll in perinatal women.

Emerging research indicates that perinatal women may be particularly vulnerable to intense worries or distress about the novel coronavirus [99, 100], including concerns about the health and safety of themselves, their unborn child, and other family members [101, 102]. Among pregnant women in the United States, Preis and colleagues identified two categories of pandemic-related stress: (1) feeling unprepared for birth due to the pandemic (i.e., "preparedness stress") and (2) fear of perinatal COVID-19 infection [103], with 30% of 4451 pregnant women reporting high levels of stress in each of these domains. In a similarly large sample pregnant women in the United States, fear of infection was endorsed by 93% of participants [104]. Liu et al. [105] also assessed levels of COVID-19-specific health worries and grief and loss associated with the pandemic (e.g., feelings of sadness related to not

being able to celebrate the birth of one's child with loved ones; bitterness at changes in daily routine or limited social support); within this perinatal sample, 18% reported high levels of COVID-19 health worries, and 9% reported high levels of grief [105].

Beyond the direct distress associated with fear of contracting COVID-19, indirect pandemic-related stressors may particularly affect perinatal women, resulting in chronic stress and high cumulative stress load. Notably, COVID-19 abruptly and dramatically changed the face of prenatal care, birth experiences, parenting support, and other psychosocial resources. In order to minimize COVID-19 disease risks for the mother and fetus, health systems and providers understandably adopted new approaches to perinatal care, including remote or telehealth consultations with providers, fewer consultation and postpartum services, or limiting the presence of partners or labor support staff during birth [106, 107]. Given the important and protective role a supportive partner, family member, or doula may have on labor and birth experiences—especially for women with prior trauma histories and BIPOC women—it is reasonable to expect associated increases in traumatic birth experiences [106]. Moyer et al. [104] reported that 25.8% of pregnant women stopped prenatal care during the COVID-19 pandemic, whereas 15.2% used video visits, and 31.8% used phone visits for prenatal care; in turn, these reductions in prenatal care and use of phone-based visits were associated with increases in pregnancy-related anxiety [104].

Other psychosocial stressors exacerbated by COVID-19 include financial stress, unemployment, eviction, and food insecurity [100, 107, 108]. Within their sample of 2740 pregnant women in the United States, Moyer et al. [104] found high levels of stress related to concerns about food availability (59%), loss of work or household income (63.7%), loss of childcare (56.3%), and conflict between household members (37.5%). As families spend more time together at home under these stressful circumstances, pandemic-related increases in domestic and intimate partner violence also pose significant safety risks for perinatal women and their children [100, 107, 108]. Finally, broader public health initiatives and social distancing guidelines (e.g., limiting contact with others outside one's immediate household) inherently reduce or eliminate access to social connections and concrete parenting support for postpartum women [100, 106, 108]. For multiparous women, the negative psychosocial impact of social distancing may include simultaneous demands of childcare, homeschooling, and remote work [108, 109]. The necessary and lifesaving importance of COVID-19 social distancing practices notwithstanding, such measures conflict with the instinctive human drive for social connection [100] and may limit empirically supported intervention approaches that aim to increase positive social support or feelings of belonging, known to reduce stress and promote resilience among perinatal women.

Relying on outcomes from prior epidemics and public health emergencies (e.g., severe acute respiratory syndrome [SARS], Middle East respiratory syndrome coronavirus [MERS-CoV] [110, 111]), stress induced by such extreme events can increase risks for negative perinatal outcomes, including perinatal mental health disorders [107]. For pregnant and postpartum women already at elevated risk for perinatal mood and anxiety disorders, the mental health implications of COVID-19

may therefore be profound [106], especially among women from marginalized populations or otherwise under-resourced communities [108]. Based on preliminary cross-cultural findings, prevalence rates of perinatal depression and anxiety increased during the COVID-19 pandemic. Across pregnancy and postpartum, rates of clinically significant perinatal mental health concerns have ranged from 23.6% to 37% among five studies assessing depression [105, 112–114]; 13.6% to 57% among six studies assessing general anxiety [102, 105, 112–115]; and 10.2% to 10.3% among two studies assessing PTSD [102, 105]. Two studies also looked at rates of pregnancy-specific anxiety (i.e., worries about the pregnancy and birth itself) in the context of COVID-19, with one reporting pregnancy-specific anxiety scores almost three times higher than similar samples assessed prior to the pandemic [115] and the other study identifying within-individual increases in pregnancy-specific anxiety from pre- to post-pandemic onset [104].

Data on risks for perinatal mental health concerns in the context of the COVID-19 pandemic are somewhat comparable to the general literature on high-risk perinatal groups, wherein depression and anxiety is higher among individuals with greater sociodemographic risk (e.g., low education, income, financial strain, food insecurity, being a woman of color [103, 104, 112]; comorbid medical complexity (e.g., pre-existing condition, high-risk pregnancy [103]); current relationship strain or tension in the home [104, 112, 115]; social isolation [112, 115]; or a history of abuse [103]. Unique to the pandemic, fear of infection, health concerns, COVID-19-related grief, and altered prenatal care were also predictive of higher depression, anxiety, and pregnancy-specific anxiety [104, 105, 115]. In particular, women with prior histories of anxiety and depression appear more likely to report increased levels of mental health concerns during the pandemic [104, 105, 112]. Although only two studies have examined perinatal PTSD in the context of COVID-19, perinatal women with a prior diagnosis of PTSD were 3.73 times more likely to develop perinatal PTSD during the pandemic [105]. Furthermore, among a sample of pregnant women in Italy recruited during a period of lockdown in March 2020, those with a history of depression or anxiety had 2.3 times the risk of developing PTSD, and this risk increased to a magnitude of 5.66 for those with a history of comorbid depression and anxiety [102].

Ultimately, conclusions across studies are limited by different measurement tools, reproductive timing, and variable community-level risks for COVID-19; however, the reviewed findings underscore the far-reaching impact and critical importance of attending to perinatal mental health concerns in the ongoing wake of the coronavirus pandemic, especially among certain high-risk groups. Such results contribute to the broader literature on the acute and long-term effects of disasters and traumatic life stress on perinatal mental health [8, 9, 116–119]. In time, a more thorough and nuanced understanding of long-term implications and potential cohort effects among offspring will emerge with ongoing longitudinal follow-up. Nevertheless, given the importance of mitigating risks for mothers, children, and families, targeted interventions may be paramount to preventing greater downstream effects. We will therefore end our chapter with a brief overview of assessment and treatment options that may help minimize the effects of trauma and stress

on perinatal women and their young children, including recommendations for minimizing risks associated with current COVID-19 stressors.

10.5   Assessment and Treatment

Although an extensive review of assessment and treatment recommendations specific to perinatal stress, trauma, and PTSD is beyond the scope of this chapter, we want to highlight several clinical recommendations that may be beneficial for individual maternal mental health and well-being, as well as evidence-based treatments that can help mitigate the transmission of intergenerational risks for trauma and toxic stress. First and foremost, preventative interventions in the context of obstetric care may help minimize stress and trauma for high-risk perinatal women. Maternity care providers, such as obstetricians, midwives, and nurses, may help reduce risks for re-traumatization or new-onset birth trauma through the promotion of effective communication, informed consent for medical procedures, and respect for birthing people's agency in making healthcare decisions [63]. The presence of a supportive person (e.g., partner, doula) during birth has also emerged as one of the most important protective factors that can mediate the relationship between prior trauma history and postpartum PTSD, as well as birth trauma and new-onset CB-PTSD [47]. As mentioned, however, many hospitals and medical systems limited the number of supportive people who can be present with a birthing person in the wake of the COVID-19 pandemic. Given these necessary limitations, other trauma-informed approaches to perinatal care may be especially crucial. In this regard, Choi et al. [108] highlighted numerous ways in which medical staff may continue to promote women's voice and choice during pregnancy, birth, and early postpartum—despite workplace restrictions related to COVID-19. Specific trauma-informed strategies medical systems may consider implementing include naming and acknowledging COVID-19 effects on birth and parenting experiences; implementing telehealth check-ins to ensure connection with hospital specialists (e.g., social workers, lactation consultants); introducing consultation-liaison services to help meet the increased mental health needs of birthing patients; and connecting medical staff with additional coping, stress relief, and psychological support as they continue to care for pregnant and postpartum patients [106–108].

In addition to sensitive and trauma-informed medical practices, adequate and systematic assessment for perinatal PTSD is an essential step toward identifying women and dyads at highest risk for negative trauma and stress-induced outcomes. Given the high psychiatric comorbidity of perinatal PTSD and depression [41, 47, 65], we join others in recommending that women with elevated depression symptoms be screened for PTSD. Furthermore, the development of postpartum PTSD may be partially mitigated by identifying women who describe their experiences during childbirth as traumatic. Once again, it is important to note that *subjective* childbirth experiences are a critical risk factor; thus, even women with uncomplicated, full-term births should be asked about their thoughts concerning labor and delivery [57]. Perinatal women with significant trauma histories and

PTSD—regardless of the criterion event—may benefit from a number of individual psychotherapies. Although there is very limited clinical literature on the efficacy and effectiveness of trauma-focused interventions among pregnant and postpartum women, combining current knowledge of perinatal PTSD with the broader PTSD treatment literature (e.g., "gold standard" exposure-based treatment [120]) is current best practice [121]. Unfortunately, however, the highest-risk mothers with significant trauma histories are often the least likely to have access to therapeutic care. As a result, assessment and treatment referrals are not sufficient, and additional emphasis must be placed on increasing access to and engagement with high-quality, trauma-focused interventions in integrated settings (e.g., integrating mental health into OB-GYN practices). Time-limited, soft-safe entry programs for high-risk mothers of young children, such as Mom Power [122], can also help perinatal women with a history of trauma and PTSD connect to additional therapeutic resources and treatment options.

Given the intergenerational impact of trauma, stress, and perinatal PTSD, mothers and their young children may particularly benefit from dyadic or two-generation treatments. The early parent-child relationship plays a critical role in the intergenerational transmission of risks *or* resilience. If a young child experiences traumatic stress, his caregiver can help him build resiliency by soothing him and helping him regulate his distress; however, when a mother herself is overwhelmed by her own trauma symptoms, she may be less able to attend to her child's needs. Specifically, children who experience prolonged and intense physiological stress, *without a sensitive and responsive caregiver*, are at greater risk for maladaptive physiological stress responses and later problems with behavioral and emotional development [123]. Dyadic approaches to mental health care thereby view the parent-child relationship as the vehicle for positive, intergenerational, healing change; and a mother's mental well-being, parenting behaviors, representations of her child, and reflective capacity are targets for intervention. A number of evidenced-based interventions were developed for high-risk parent-child dyads, including perinatal women and infants exposed to toxic stress and trauma (for reviews, see [7, 124, 125]). A summary of several dyadic treatments previously published by the authors [7] is provided in Table 10.1. The interventions in Table 10.1 share a common foundation in attachment theory but vary in their specific modality, length, and treatment components. Notably, several of interventions, such as Child-Parent Psychotherapy (CPP; [142, 160]) and Attachment and Biobehavioral Catch-up (ABC; [127]), were designed for young children and their parents exposed to early adversity or trauma. Among the clinical targets, these programs help young children develop a play-based narrative of traumatic experiences (CPP) or help mothers support their child's emerging regulatory skills in the face of ongoing stressors (ABC). As an illustrative example, CPP places explicit emphasis on the caregiver's own trauma history and how this may affect her thoughts about and behaviors toward her child [142, 160]. As we understand more about the intergenerational importance of intervening as early as possible, an extension of CPP was recently created for the period of pregnancy through the first 6 months postpartum [161]. Ultimately, the Perinatal Child-Parent Psychotherapy (P-CPP) approach supports birthing people and their partners

Table 10.1 Description of existing two-generation interventions targeting parenting and attachment relationships within high-risk dyads[a]

Intervention	Population/participants/duration/setting	Treatment description and modality	Evidence base
Attachment and biobehavioral catch-up (ABC) *For infants (ABC-I)* [126–136] *For toddlers (ABC-T)* [137]	Children with experiences of early adversity ABC-I: 6 months–2 years old ABC-T: 2–4 years old Parent–child dyad 10 weeks of 1-h sessions Home	• Help caregivers provide nurturing care, even if the child pushes the caregiver away • Help caregivers provide a responsive, predictable environment that helps the child develop regulatory abilities • Coach caregivers to follow the child's lead and show delight in the child • Help caregivers decrease behaviors that may be frightening or overwhelming to the child • ABC-T (specifically): Teach caregivers ways to co-regulate their children when they are distressed • Video feedback, homework, and in-the-moment feedback are used to reach these goals	ABC-I: RCTs with at-risk children ($N = 24$ to 120) and children in foster care ($N = 46$ to 173). ABC-I is associated with: • Lower rates of child disorganized attachment, higher rates of secure attachment, less avoidant behavior • Lower child negative affect during a challenging task • Lower child internalizing and externalizing behavior • Higher child cognitive flexibility, theory of mind skills, and receptive vocabulary • More normative child diurnal pattern of cortisol production, with effects persisting into preschool age • Improvements in sensitive caregiving, decreases in intrusive caregiving • Lower scores on measures of child abuse potential and parenting stress • Enhanced maternal ERP responses for emotional faces relative to neutral faces ABC-T: RCT with children in foster care ($N = 173$). ABC-T is associated with: • Lower rates of attention problems, higher cognitive flexibility

Child and family interagency resource, support, and training (Child FIRST) [138]	Children at high risk of emotional, behavioral, or developmental problems, or child maltreatment 0–5 years old Parent-child dyad 6–12 months; 2x/week for first month, then weekly sessions for 1–1.5 h Home or early care and education setting	• Treatment team consists of mental health/developmental clinician and a care coordinator • Provide trauma-informed child-parent psychotherapy and parent guidance • Offer care coordination and connection to community services • Observe and collaborate with teachers in early care and education settings	RCT with multi-risk urban mothers and children ($N = 157$). Child FIRST is associated with: • Improved child language • Improved child externalizing symptoms • Less parenting stress • Lower maternal psychopathology symptoms • Less protective service involvement • Greater access to wanted services
Child-parent psychotherapy (CPP) [139–144]	Children exposed to trauma 0–5 years old Parent-child dyad, with some parent-only sessions ~1 year ($M = 32$ sessions) of 1–1.5 h weekly sessions Home or clinic	• Focus on safety, affect regulation, reciprocity in relationships, continuity of daily living, with emphasis on the traumatic event • Create shared positive memories • Help dyad develop a play-based narrative of traumatic experience • Foundational phase: Develop trauma-informed formulation of dyad's functioning • Core intervention phase: Provide play-based developmental-relational therapy • Sustainability and termination phase: Help the family process upcoming goodbye and reviews family story • Utilizes reflective supervision for the providing clinician	RCTs with anxiously attached dyads ($N = 93$), children with depressed mothers ($N = 108, 198$), low-income families with a history of maltreatment ($N = 122, 137$), witnesses of domestic violence ($N = 75, 50$). CPP is associated with: • More positive mother-child relationship expectations • Higher parental empathic responsiveness and goal-corrected partnership, lower angry behavior • Lower likelihood of child anxious attachment • Increases in levels of child secure attachment • Decreases in child traumatic stress disorder symptoms and behavior problems • Reductions in problematic maternal representations • Decline in maternal avoidant symptoms, general distress, and PTSD symptoms

Table 10.1 (continued)

Intervention	Population/participants/duration/setting	Treatment description and modality	Evidence base
Circle of security (COS) *Home Visiting-4 (COS-HV4)* [145] *COS group* [146, 147] *COS-parenting (COS-P)* [148] *COS-perinatal protocol (COS-PP)* [149]	High-risk populations (e.g., enrolled in early head start, teen moms, irritable babies, incarcerated perinatal women) Prenatal—5 years old Parent-only (COS-HV4) Parent group (COS group, COS-P, COS-PP) COS-HV4, 1 3-h assessment session and 4 1.5-h sessions over 3 months; COS group, 20 weekly 1.25-h sessions; COS-P, 10 weekly 1.5-h sessions; COS-PP, twice-weekly 90-min group sessions from third trimester through 12 months postpartum Home (COS-HV4); clinic, facility, or community (COS group, COS-P, COS-PP)	• Teach caregivers about attachment theory using the "circle" graphic • Help parents provide a "safe haven" in times of distress or threat and a "secure base" in times of exploration • Teach parents about ways children might "miscue" what they need • Help caregivers see how their own strong feelings influence their responses to their children • COS-HV4, COS group, COS-PP: Review of video of caregiver interacting with his or her own child (or stock footage of mother-infant interactions for pregnant participants in COS-PP) • COS-P DVD-based delivery of key COS concepts in order to make program more accessible	COS-HV4 RCT with low-income mothers with irritable infants ($N = 220$). COS-HV4 is associated with: • Reduced risk of child insecure attachment, for dismissing mothers with highly irritable infants COS group pre-post design with low-income children and their caregivers ($N = 65$) and clinically referred children and their caregivers ($N = 83$). COS group is associated with: • Shift from child disorganized to organized (mostly secure) attachment classifications • Improved caregiver reflective functioning and caregiving representations COS-P RCT with low-income children and their caregivers ($N = 141$). COS-P is associated with: • Fewer unsupportive maternal responses to child distress • Improved child inhibitory control COS-PP pre-post design with high-risk perinatal women in a jail diversion program for nonviolent offenders with a history of substance abuse ($N = 20$). COS-PP is associated with: • Improvements in maternal depressive symptomatology • Rates of infant attachment security and disorganization comparable to existing rates in low-risk samples • Comparable levels of maternal sensitivity to existing community comparisons

| **Minding the baby** [150] | First-time parents at high risk for problems (e.g., young maternal age, poverty, history of trauma)
Prenatal—2 years old
Parent-child dyad
Weekly 1-h sessions prenatally through the first year, then biweekly sessions until age 2
Home | • Help parents become more reflective and responsive during interactions with their infant
• Team consists of pediatric nurse practitioner and clinical social worker; providers alternate who attends home visit
• When applicable, social worker conducts mental health assessment and provides treatment to parent
• Home visitors maintain close contact with mother's and child's physicians and coach families with regard to healthcare information and accessing social services | RCT with primiparous women receiving care at a community health center ($N = 105$). Minding the baby is associated with:
• Higher likelihood of being on-track with child immunization schedule
• Lower rates of rapid subsequent childbearing
• Lower likelihood of referral to child protective services
• Higher likelihood of child secure attachment relationship; lower likelihood of child disorganized attachment relationship
• Improved maternal capacity to reflect on their own and their child's experience for mothers who were high-risk
• Less likely to have disrupted mother-infant interactions when mothers were teenagers |

Table 10.1 (continued)

Intervention	Population/participants/duration/setting	Treatment description and modality	Evidence base
Mom power (MP) [8, 9, 122, 151–156]	High-risk populations, often with maternal trauma and psychopathology Prenatal—6 years old Group-based: Separate mother and child groups run simultaneously, in conjunction with guided parent-child interactions 10 weeks of 3-h group sessions, plus 1–3 individual sessions Clinic or community setting (e.g., church, community center)	• Teach mothers an attachment-based parenting education curriculum using the "tree" metaphor of "building roots" (connecting) and "branching out" (exploring) • Focus on maternal self-care skills such as diaphragmatic breathing and progressive muscle relaxation • Enhance peer/social support with other group members and with external parenting support in mothers' lives • Engage and connect mothers to ongoing care, when indicated • Corresponding child curriculum focuses on child-led play • Includes in vivo guided parent-child interactions (separations and reunions)	Pre-post design with low income mothers and their children (N = 99). MP is associated with: • Decreased maternal depression, PTSD, and caregiving helplessness • Improved maternal reflective capacity • Improved parenting confidence, social support, and connection to care RCT with high-risk mothers and their children (N = 122). MP is associated with: • Improvements in mental health symptoms and parenting stress • Improved maternal reflective capacity • Increase in "balanced" maternal representations • Better outcomes for mothers with a history of interpersonal trauma • Improvement in mothers' brain-based indices of social cognition and empathy

| **Mother-infant therapy group (M-ITG)** [157, 158] | High-risk mothers with postpartum depression and their infants
1 month–2 years old
Group-based: Separate mother, child, and dyadic group components; 2 sessions with mother's romantic partner
12 weeks of 1.5-h group sessions, plus initial intake
Clinic or community setting | • Address postpartum depression symptoms, including the impact on infant development, relationships with others, and the parent-child relationship, specifically
• Teach more adaptive relational and coping skills
• Reduce social isolation and facilitate peer support and learning through the experiences of others
• Corresponding infant group provides an emotionally responsive environment to support child development
• Includes dyadic component to foster positive interactions between mothers and infants | Pre-post designs with depressed mothers and their children (*N* = 13, 18). M-ITG is associated with:
• Decreases in maternal depressive symptoms
• Increases in maternal reports of their infants as reinforcing and adaptable
• Improvements in mother's positive affect, verbalization, and communication during interactions with their infants |

[a] Note: Table is reprinted with permission from [7]; adapted from [125, 159]

as they make sense of how their adverse and traumatic life experiences have affected them; how these experiences may be evoked within the parent-child relationship; and how they can create a loving, caring, and safe environment for themselves and their babies, despite what happened.

10.6   Conclusion

A trauma-informed approach to supporting women and families in the perinatal period must recognize the proximal and distal risk factors that may put perinatal women at risk for developing PTSD. In the current chapter, we summarized the literature on perinatal PTSD, focusing on birth trauma, childhood maltreatment, and the COVID-19 pandemic as three critical traumatic stressors that may confer risk. Trauma-informed perinatal mental health care must consider the multifaceted strengths and vulnerabilities of each birthing person and create space to consider how what happened to an individual before, during, and after birth may impact her own mental health and the well-being of her family. Given the potential intergenerational impact of untreated and unresolved trauma, we briefly identified assessment and treatment options for perinatal women and mothers of young children exposed to trauma or significant adversity, and we highlighted several evidence-based dyadic interventions. Our hope is that the field of perinatal mental health can continue to integrate, acknowledge, and attend to the role of traumatic stress using a multigenerational lens that considers a mother's own childhood experiences (e.g., childhood maltreatment), her subjective appraisals of labor and delivery, and other contextual stressors and risk factors that may contribute to the development or exacerbation of PTSD. Ultimately, such an approach to perinatal mental health has the potential to build resiliency and effect change across generations.

References

1. Bowers ME, Yehuda R. Intergenerational transmission of stress in humans. Neuropsychopharmacol Rev. 2016;41:232–44. https://doi.org/10.1038/npp.2015.247.
2. Brisson D, McCune S, Wilson JH, Speer SR, McCrae JS, Hoops Calhoun K. A systematic review of the association between poverty and biomarkers of toxic stress. J Evid Based Soc Work. 2020;17(6):696–713.
3. American Psychological Association. APA dictionary of psychology; 2020. Retrieved August 26 from 2020 from https://dictionary.apa.org/trauma
4. International Society for Traumatic Stress Studies. What is traumatic stress?; 2016. Retrieved on August 26, 2020 from https://istss.org/public-resources/what-is-traumatic-stress
5. Herman JL. Trauma and recovery: from domestic abuse to political terror. London: Pandora; 1992.
6. Van Der Kolk BA, Roth S, Pelcovitz D, Sunday S, Spinazzola J. Disorders of extreme stress: the empirical foundation of a complex adaptation to trauma. J Trauma Stress. 2005;18(5):389–99. https://doi.org/10.1002/jts.20047.
7. Erickson NL, Julian M, Muzik M. Perinatal depression, PTSD, and trauma: impact on mother-infant attachment and interventions to mitigate the transmission of risk. Int Rev Psychiatry. 2019;31(3):245–63. https://doi.org/10.1080/09540261.2018.1563529. Epub 2019 Feb 27

8. Muzik M, Mcginnis EW, Bocknek E, Morelen D, Rosenblum K, Liberzon I, et al. PTSD symptoms across pregnancy and early postpartum among women with lifetime PTSD diagnosis. Depress Anxiety. 2016a;33:584–91. https://doi.org/10.1002/da.22465.
9. Muzik M, Rosenblum KL, Schuster MM, Kohler ES, Alfafara EA, Miller NM. A mental health and parenting intervention for adolescent and young adult mothers and their infants. J Depress Anxiety. 2016b;5(3):2167–1044. https://doi.org/10.4200/2167-1044.1000233.
10. Banyard VL, Williams LM, Siegel JA. The long-term mental health consequences of child sexual abuse: an exploratory study of the impact of multiple traumas in a sample of women. J Trauma Stress. 2001;14:697–715. https://doi.org/10.1023/A:1013085904337.
11. Seng JS, Low LK, Sperlich M, Ronis DL, Liberzon I. Prevalence, trauma history, and risk for posttraumatic stress disorder among nulliparous women in maternity care. Obstet Gynecol. 2009;114(4):839–47. https://doi.org/10.1097/AOG.0b013e3181b8f8a2.
12. Sperlich M, Seng JS. Survivor moms: women's narratives of birthing, mothering, and healing after sexual abuse. Eugene, OR: Motherbaby Press; 2008.
13. Bastos MH, Furuta M, Small R, McKenzie-McHarg K, Bick D. Debriefing interventions for the prevention of psychological trauma in women following childbirth. Cochrane Database Syst Rev. 2015;4:Art. No. CD007194. https://doi.org/10.1002/14651858.CD007194.pub2.
14. Beck CT. Birth trauma: in the eye of the beholder. Nurs Res. 2004;53:28–35. https://doi.org/10.1097/00006199-200401000-00005.
15. Boorman RJ, Devilly GJ, Gamble J, Creedy DK, Fenwick J. Childbirth and criteria for traumatic events. Midwifery. 2014;30:255–61. https://doi.org/10.1016/j.midw.2013.03.001. Epub 2013 Apr 26
16. Buss C, Entringer S, Moog NK, Toepfer P, Fair DA, Simhan HN, Heim CM, Wadhwa PD. Intergenerational transmission of maternal childhood maltreatment exposure: implications for fetal brain development. J Am Acad Child Adolesc Psychiatry. 2017;56(5):373–82. https://doi.org/10.1016/j.jaac.2017.03.001.
17. Schwerdtfeger KL, Nelson Goff BS. Intergenerational transmission of trauma: exploring mother-infant prenatal attachment. J Trauma Stress. 2007;20:39–51. https://doi.org/10.1002/jts.
18. Agorastos A, Pervanidou P, Chrousos GP, Baker DG. Developmental trajectories of early life stress and trauma: a narrative review on neurobiological aspects beyond stress system dysregulation. Front Psychiatry. 2019;10:118. https://doi.org/10.3389/fpsyt.2019.00118.
19. Sexton MB, Bennet DC, Muzik M, Rosenblum KL. Resilience, recovery, and therapeutic interventions for peripartum women with histories of trauma. In: Muzik M, Rosenblum KL, editors. Motherhood in the face of trauma. London: Springer; 2018. p. 115–30.
20. Thomason ME, Marusak HA. Review toward understanding the impact of trauma on the early developing human brain. Neuroscience. 2017;342:55–67. https://doi.org/10.1016/j.neuroscience.2016.02.022.
21. Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards E, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the adverse childhood experiences (ACE) study. Am J Prevent Med. 1998;14:245–58.
22. Huang H, Yan P, Shan Z, Chen S, Li M, Luo C, Gao H, Hao L, Liu L. Adverse childhood experiences and risk of type 2 diabetes: a systematic review and meta-analysis. Metab Clin Exp. 2015;64(11):1408–18. https://doi.org/10.1016/j.metabol.2015.08.019.
23. Ports KA, Holman DM, Guinn AS, Pampati S, Dyer KE, Merrick MT, Lunsford NB, Metzler M. Adverse childhood experiences and the presence of cancer risk factors in adulthood: a scoping review of the literature from 2005 to 2015. J Pediatr Nurs. 2019;44:81–96. https://doi.org/10.1016/j.pedn.2018.10.009.
24. Su S, Jimenez MP, Roberts CT, Loucks EB. The role of adverse childhood experiences in cardiovascular disease risk: a review with emphasis on plausible mechanisms. Curr Cardiol Rep. 2015;17(10):88. https://doi.org/10.1007/s11886-015-0645-1.
25. Berkowitz G, Wolff M, Janevic T, Holzman I, Yehuda R, Landrigan P. The world trade center disaster and intrauterine growth restriction. J Am Med Assoc. 2003;290:595–6.
26. Cederbaum JA, Putnam-Hornstein E, King B, Gilbert K, Needell B. Infant birth weight and maltreatment of adolescent mothers. Am J Prevent Med. 2013;45:197–201.

27. Christiaens I, Hegadoren K, Olson DM. Adverse childhood experiences are associated with spontaneous preterm birth: a case-control study. BMC Med. 2015;13:124. https://doi.org/10.1186/s12916-015-0353-0.

28. Coussons-Read ME, Okun ML, Schmitt MP, Giese S. Prenatal stress alters cytokine levels in a manner that may endanger human pregnancy. Psychosom Med. 2005;67:625–31.

29. Glover V. Maternal stress or anxiety in pregnancy and emotional development of the child. Br J Psychiatry. 1997;171:105–6.

30. Lederman SA, Rauh V, Weiss L, Stein JL, Hoepner LA, Becker M, Perera FP. The effects of the world trade center event on birth outcomes among term deliveries at three lower Manhattan hospitals. Environ Health Perspect. 2004;112:1772–8. https://doi.org/10.1289/ehp.7348.

31. Wadhwa PD, Sandman CA, Porto M, Dunkel Schetter C, Garite TJ. The association between prenatal stress and infant birth weight and gestational age at birth: a prospective investigation. Am J Obstetr Gynecol. 1993;164:858–65.

32. Yonkers KA, Smith MV, Forray A, Epperson CN, Costello D, Lin H, Belanger K. Pregnant women with posttraumatic stress disorder and risk of preterm birth. JAMA Psychiatry. 2014;71(8):897–904.

33. Kezelman CA, Stavropoulos PA Practice guidelines for clinical treatment of complex trauma. Blue knot foundation; 2019. Retrieved February 20, 2021 from https://www.blueknot.org.au/Portals/2/Practice%20Guidelines/BlueKnot_Practice_Guidelines_2019.pdf

34. Ross CA, Halpern N. Trauma model therapy: a treatment approach for trauma, Dissociation and Complex Comorbidity Richardson, TXL Manitou Communications; 2009

35. American Psychiatric Association. Diagnostic and statistical manual of mental disorders (5th ed.). Washington, DC: Author. 2013.

36. American College of Obstetricians and Gynecologists. Racial and ethnic disparities in obstetrics and gynecology. Committee opinion no. 649. Obstet Gynecol. 2015;126:e130–4.

37. Hardeman RR, Karbeah J, Kozhimannil KB. Applying a critical race lens to relationship-centered care in pregnancy and childbirth: an antidote to structural racism. Birth. 2019;47:3–7. https://doi.org/10.1111/birt.12462.

38. Seng JS, Kohn-Wood LP, Mcpherson MD, Sperlich M, Seng JS, Kohn-Wood LP, et al. Disparity in posttraumatic stress disorder diagnosis among African American pregnant women. Arch Womens Ment Health. 2011a;14:295–306. https://doi.org/10.1007/s00737-011-0218-2.

39. Seng JS, Low LK, Sperlich M, Ronis DL, Liberzon I. Post-traumatic stress disorder, child abuse history, birthweight and gestational age: A prospective cohort study. BJOG Int J Obstet Gynaecol. 2011b;118(11):1329–39. https://doi.org/10.1111/j.1471-0528.2011.03071.x.

40. Loveland Cook CA, Flick LH, Homan SM, Campbell C, McSweeney M, Gallagher ME. Posttraumatic stress disorder in pregnancy: prevalence, risk factors, and treatment. Obstet Gynecol. 2004;103(4):710–7. https://doi.org/10.1097/01.AOG.0000119222.40241.fb.

41. Grekin R, O'Hara MW. Prevalence and risk factors of postpartum posttraumatic stress disorder: a meta-analysis. Clin Psychol Rev. 2014;34(5):389–401. https://doi.org/10.1016/j.cpr.2014.05.003.

42. Yildiz PD, Ayers S, Phillips L. The prevalence of posttraumatic stress disorder in pregnancy and after birth: a systematic review and meta-analysis. J Affect Disord. 2017;208:634–45. https://doi.org/10.1016/j.jad.2016.10.009.

43. Oh W, Muzik M, McGinnis EW, Hamilton L, Menke RA, Rosenblum KL. Comorbid trajectories of postpartum depression and PTSD among mothers with childhood trauma history: course, predictors, processes and child adjustment. J Affect Disord. 2016;200:133–41. https://doi.org/10.1016/j.jad.2016.04.037.

44. Dekel S, Stuebe C, Dishy G. Childbirth induced posttraumatic stress syndrome: a systematic review of prevalence and risk factors. Front Psychol. 2017;8:560. https://doi.org/10.3389/fpsyg.2017.00560.

45. Fisher J, Acton C, Rowe H. Mental health problems among childbearing women: historical perspectives and social determinants. In: Muzik M, Rosenblum KL, editors. Motherhood in the face of trauma. Cham: Springer; 2018. p. 3–22.

46. Thiel F, Dekel S. Peritraumatic dissociation in childbirth-evoked posttraumatic stress and postpartum mental health. Arch Womens Ment Health. 2020;23(2):189–97. https://doi.org/10.1007/s00737-019-00978-0.

47. Ayers S, Bond R, Bertullies S, Wijma K. The aetiology of post-traumatic stress following childbirth: a meta-analysis and theoretical framework. Psychol Med. 2016;46(6):1121–34. https://doi.org/10.1017/S0033291715002706.

48. Thiel F, Ein-Dor T, Dishy G, King A, Dekel S. Examining symptom clusters of childbirth-related posttraumatic stress disorder. Prim Care Companion CNS Disord. 2018;20(5):18m02322. https://doi.org/10.4088/PCC.18m02322.

49. Beck CT. The slippery slope of birth trauma. In: Muzik M, Rosenblum KL, editors. Motherhood in the face of trauma. Springer; 2018. p. 55–68.

50. Andersen LB, Melvaer LB, Videbech P, Lamont RF, Joergensen JS. Risk factors for developing post-traumatic stress disorder following childbirth: a systematic review. Acta Obstet Gynecol Scand. 2012;91:1261–72. https://doi.org/10.1111/j.1600-0412.2012.01476.x.

51. Beck, CT, & Watson S. Subsequent childbirth after a previous traumatic birth. Nursing research. 2010;59(4):241–249. https://doi.org/10.1097/NNR.0b013e3181e501fd

52. Bowman ML. Individual differences in posttraumatic distress: problems with the DSM-IV model. Can J Psychiatr. 1999;44:21–33. https://doi.org/10.1177/070674379904400103.

53. Dekel S, Hankin IT, Pratt JA, Hackler DR, Lanman ON. Posttraumatic growth in trauma recollections of 9/11 survivors: a narrative approach. J Loss Trauma. 2016;21:315–24. https://doi.org/10.1080/15325024.2015.1108791.

54. Czarnocka J, Slade P. Prevalence and predictors of post-traumatic stress symptoms following childbirth. Br J Clin Psychol. 2000;39:35–51. https://doi.org/10.1348/014466500163095.

55. Olde E, van der Hart O, Kleber RJ, van Son MJM, Wijnen HAA, Pop VJM. Peritraumatic dissociation and emotions as predictors of PTSD symptoms following childbirth. J Trauma Dissociation. 2005;6:125–42.

56. Verreault N, Da Costa D, Marchand A, Ireland K, Banack H, Dritsa M, et al. PTSD following childbirth: a prospective study of incidence and risk factors in Canadian women. J Psychosom Res. 2012;73:257–63. https://doi.org/10.1016/j.jpsychores.2012.07.010.

57. de Graaff LF, Honig A, van Pampus MG, Stramrood CAI. Preventing post-traumatic stress disorder following childbirth and traumatic birth experiences: a systematic review. Acta Obstet Gynecol Scand. 2018;97(6):648–56. https://doi.org/10.1111/aogs.13291.

58. Vedam S, Stoll K, Taiwo TK, et al. The giving voice to mothers study: inequity and mistreatment during pregnancy and childbirth in the United States. Reprod Health. 2019;16:77. https://doi.org/10.1186/s12978-019-0729-2.

59. Alcorn KL, O'Donovan A, Patrick JC, Creedy D, Devilly GJ. A prospective longitudinal study of the prevalence of post-traumatic stress disorder resulting from childbirth events. Psychol Med. 2010;40:1849–59.

60. Kountanis JA, Muzik M, Chang T, Langen E, Cassidy R, Mashour GA, Bauer ME. Relationship between postpartum mood disorder and birth experience: a prospective observational study. Int J Obstet Anesth. 2020;44:90–9. https://doi.org/10.1016/j.ijoa.2020.07.008.

61. Olde E, van der Hart O, Kleber R, van Son M. Posttraumatic stress following childbirth: A review. Clin Psychol Rev. 2006;26:1–16. https://doi.org/10.1016/j.cpr.2005.07.002.

62. Ayers S. Delivery as a traumatic event: prevalence, risk factors, and treatment for postnatal posttraumatic stress disorder. Clin Obstet Gynecol. 2004;47:552–67.

63. Koster D, Romijn C, Sakko E, Stam C, Steenhuis N, de Vries D, et al. Traumatic childbirth experiences: practice-based implications for maternity care professionals from the woman's perspective. Scand J Caring Sci. 2020;34(3):792–9. https://doi.org/10.1111/scs.12786.

64. Beck CT. Pentadic cartography: mapping birth trauma narratives. Qual Health Res. 2006;16:453–66.

65. Dekel S, Ein-Dor T, Dishy GA, Mayopoulos PA. Beyond postpartum depression: posttraumatic stress-depressive response following childbirth. Arch Womens Ment Health. 2020;23:557–64. https://doi.org/10.1007/s00737-019-01006-x/Published.

66. Davies J, Slade P, Wright I, Stewart P. Posttraumatic stress symptoms following childbirth and mothers' perceptions of their infants. Infant Ment Health J. 2008;29(6):537–54. https://doi.org/10.1002/imhj.20197.

67. DiBlasio P, Camisasca E, Miragoli S, Ionio C, Milani L. Does maternal parenting stress mediate the association between postpartum PTSD symptoms and children's internalizing and externalizing problems? A longitudinal perspective. Child Youth Care Forum. 2017;46(5):685–701. https://doi.org/10.1007/s10566-017-9400-7.

68. McDonald S, Slade P, Spiby H, Iles J. Posttraumatic stress symptoms, parenting stress, and mother-child relationships following childbirth and at 2 years postpartum. J Psychosom Obstet Gynecol. 2011;32(2):141–6. https://doi.org/10.3109/0167482X.2011.596962.

69. Dekel S, Ein-Dor T, Berman Z, Barsoumian IS, Agarwal S, Pitman RK. Delivery mode is associated with maternal mental health following childbirth. Arch Womens Ment Health. 2019;22(6):817–24. https://doi.org/10.1007/s00737-019-00968-2.

70. Beck CT, Watson S. Mothers' experiences interacting with infants after traumatic childbirth. MCN Ame J Matern Child Nurs. 2019;44(6):338–44. https://doi.org/10.1097/NMC.0000000000000565.

71. Choi KW, Sikkema KJ. Childhood maltreatment and perinatal mood and anxiety disorders: a systematic review. Trauma Violence Abuse. 2016;17(5):427–53. https://doi.org/10.1177/1524838015584369.

72. Muzik M, Bocknek EL, Broderick A, Richardson P, Rosenblum KL, Thelen K, Seng JS. Mother–infant bonding impairment across the first 6 months postpartum: the primacy of psychopathology in women with childhood abuse and neglect histories. Arch Womens Ment Health. 2013;16(1):29–38. https://doi.org/10.1007/s00737-012-0312-0.

73. Onoye JM, Shafer LA, Goebert DA, Morland LA, Matsu CR, Hamagami F. Changes in PTSD symptomatology and mental health during pregnancy and postpartum. Arch Womens Ment Health. 2013;16(6):453–63. https://doi.org/10.1007/s00737-013-0365-8.

74. World Health Organization. (2020, June 8). Child Maltreatment. https://www.who.int/news-room/fact-sheets/detail/child-maltreatment.

75. Centers for Disease Control and Prevention. Preventing Adverse Childhood Experiences; 2020. https://www.cdc.gov/violenceprevention/aces/fastfact.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fviolenceprevention%2Facestudy%2Ffastfact.html.

76. Singh MM, Parsekar SS, Nair SN. An epidemiological overview of child sexual abuse. J Fam Med Prim Care. 2014;3(4):430–5. https://doi.org/10.4103/2249-4863.148139.

77. Gilbert LK, Breiding MJ, Merrick MT, Thompson WW, Ford DC, Dhingra SS, Parks SE. Childhood adversity and adult chronic disease: an update from ten states and the District of Columbia, 2010. Am J Prev Med. 2015;48(3):345–9. https://doi.org/10.1016/j.amepre.2014.09.006.

78. Bert SC, Guner BM, Lanzi RG. The influence of maternal history of abuse on parenting knowledge and behavior. Fam Relat. 2009;58(2):176–87. https://doi.org/10.1111/j.1741-3729.2008.00545.x.

79. Smith AL, Cross D, Winkler J, Jovanovic T, Bradley B. Emotional dysregulation and negative affect mediate the relationship between maternal history of child maltreatment and maternal child abuse potential. J Fam Violence. 2014;29(5):483–94. https://doi.org/10.1007/s10896-014-9606-5.

80. Leeners B, Stiller R, Block E, Görres G, Rath W. Pregnancy complications in women with childhood sexual abuse experiences. J Psychosom Res. 2010;69(5):503–10. https://doi.org/10.1016/j.jpsychores.2010.04.017.

81. Nagl M, Steinig J, Klinitzke G, Stepan H, Kersting A. Childhood maltreatment and pre-pregnancy obesity: a comparison of obese, overweight, and normal weight pregnant women. Arch Womens Ment Health. 2016;19(2):355–65. https://doi.org/10.1007/s00737-015-0573-5.

82. Moog NK, Heim CM, Entringer S, Kathmann N, Wadhwa PD, Buss C. Childhood maltreatment is associated with increased risk of subclinical hypothyroidism in pregnancy. Psychoneuroendocrinology. 2017;84:190–6. https://doi.org/10.1016/j.psyneuen.2017.07.482.

83. Moog NK, Buss C, Entringer S, Shahbaba B, Gillen DL, Hobel CJ, Wadhwa PD. Maternal exposure to childhood trauma is associated during pregnancy with placental-fetal stress physiology. Biol Psychiatry. 2016;79(10):831–9. https://doi.org/10.1016/j.biopsych.2015.08.032.

84. Heim C, Shugart M, Craighead WE, Nemeroff CB. Neurobiological and psychiatric consequences of child abuse and neglect. Dev Psychobiol. 2010;52(7):671–90. https://doi.org/10.1002/dev.20494.

85. Moog NK, Entringer S, Rasmussen JM, Styner M, Gilmore JH, Kathmann N, Heim CM, Wadhwa PD, Buss C. Intergenerational effect of maternal exposure to childhood maltreatment on newborn brain anatomy. Biol Psychiatry. 2018;83(2):120–7. https://doi.org/10.1016/j.biopsych.2017.07.009.

86. Davalos DB, Yadon CA, Tregellas HC. Untreated prenatal maternal depression and the potential risks to offspring: a review. Arch Womens Ment Health. 2012;15(1):1–14. https://doi.org/10.1007/s00737-011-0251-1.

87. Deave T, Heron J, Evans J, Emond A. The impact of maternal depression in pregnancy on early child development. BJOG Int J Obstet Gynaecol. 2008;115(8):1043–51. https://doi.org/10.1111/j.1471-0528.2008.01752.x.

88. Lovejoy MC, Graczyk PA, O'Hare E, Neuman G. Maternal depression and parenting behavior: A meta-analytic review. Clin Psychol Rev. 2000;20(5):561–92. https://doi.org/10.1016/S0272-7358(98)00100-7.

89. O'Hara MW, McCabe JE. Postpartum depression: current status and future directions. Annu Rev Clin Psychol. 2013;9(1):379–407. https://doi.org/10.1146/annurev-clinpsy-050212-185612.

90. Morelen D, Rosenblum KL, Muzik M. Childhood maltreatment and motherhood: implications for maternal well-being and mothering. Motherhood in the Face of Trauma. Springer; 2018. p. 23–37.

91. Muzik M, Morelen D, Hruschak J, Rosenblum KL, Bocknek E, Beeghly M. Psychopathology and parenting: an examination of perceived and observed parenting in mothers with depression and PTSD. J Affect Disord. 2017;207:242–50. https://doi.org/10.1016/j.jad.2016.08.035.

92. Bailey HN, DeOliveira C, Wolfe V V, Evans EM, & Hartwick C. The impact of childhood maltreatment history on parenting: a comparison of maltreatment types and assessment methods. Child abuse & neglect. 2012;36(3):236–246. https://doi.org/10.1016/j.chiabu.2011.11.005.

93. Stacks, A. M., Muzik, M., Wong, K., Beeghly, M., Huth-Bocks, A., Irwin, J. L., & Rosenblum, K. L. (2014). Maternal reflective functioning among mothers with childhood maltreatment histories: links to sensitive parenting and infant attachment security. Attachment & human development. 16(5):515–533. https://doi.org/10.1080/14616734.2014.935452.

94. Fava NM, Simon VA, Smith E, Khan M, Kovacevic M, Rosenblum KL, Menke R, Muzik M. Perceptions of general and parenting-specific posttraumatic change among postpartum mothers with histories of childhood maltreatment. Child Abuse Negl. 2016;56:20–9. https://doi.org/10.1016/j.chiabu.2016.04.007.

95. Khalil A, Kalafat E, Benlioglu C, O'Brien P, Morris E, Draycott T, et al. SARS-CoV-2 infection in pregnancy: a systematic review and meta-analysis of clinical features and pregnancy outcomes. EClinicalMedicine. 2020;25:100446. https://doi.org/10.1016/j.eclinm.2020.100446.

96. Sutton D, Fuchs K, D'Alton M, Goffman D. Universal screening for SARS-CoV-2 in women admitted for delivery. N Engl J Med. 2020;382(22):2163–4. https://doi.org/10.1056/NEJMc2009316.

97. Allotey J, Stallings E, Bonet M, Yap M, Chatterjee S, Kew T, et al. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. BMJ. 2020;370 https://doi.org/10.1136/bmj.m3320.

98. Di Mascio D, Khalil A, Saccone G, Rizzo G, Buca D, Liberati M, et al. Outcome of coronavirus spectrum infections (SARS, MERS, COVID-19) during pregnancy: a systematic review and meta-analysis. Am J Obstet Gynecol MFM. 2020;2(2):100107. https://doi.org/10.1016/j.ajogmf.2020.100107.

99. Brooks SK, Weston D, Greenberg N. Psychological impact of infectious disease outbreaks on pregnant women: rapid evidence review. Public Health. 2020;189:26–36. https://doi.org/10.1016/j.puhe.2020.09.006.

100. Caparros-Gonzalez RA, Alderdice F. The COVID-19 pandemic and perinatal mental health. J Reprod Infant Psychol. 2020;38(3):223–5. https://doi.org/10.1080/02646838.2020.1786910.

101. Corbett GA, Milne SJ, Hehir MP, Lindow SW, O'Connell MP. Health anxiety and behavioural changes of pregnant women during the COVID-19 pandemic. Eur J Obstet Gynecol Reprod Biol. 2020;249:96–7. https://doi.org/10.1016/j.ejogrb.2020.04.022.

102. Ravaldi C, Ricca V, Wilson A, Homer C, Vannacci A. Previous psychopathology predicted severe COVID-19 concern, anxiety and PTSD symptoms in pregnant women during lockdown in Italy. Arch Women's Mental Health. 2020;23(6):783–6. https://doi.org/10.1101/2020.08.26.20182436.

103. Preis H, Mahaffey B, Heiselman C, Lobel M. Vulnerability and resilience to pandemic-related stress among U.S. women pregnant at the start of the COVID-19 pandemic. Soc Sci Med. 2020;266:113348. https://doi.org/10.1016/j.socscimed.2020.113348.

104. Moyer CA, Compton SD, Kaselitz E, Muzik M. Pregnancy-related anxiety during COVID-19: a nationwide survey of 2740 pregnant women. Arch Womens Ment Health. 2020;23(6):757–65. https://doi.org/10.1007/s00737-020-01073-5.

105. Liu CH, Erdei C, Mittal L. Risk factors for depression, anxiety, and PTSD symptoms in perinatal women during the COVID-19 pandemic. Psychiatry Res. 2021;295:113552. https://doi.org/10.1016/j.psychres.2020.113552.

106. Hermann A, Fitelson EM, Bergink V. Meeting maternal mental health needs during the COVID-19 pandemic. JAMA Psychiatry. 2021;78(2):123–4. https://doi.org/10.1001/jamapsychiatry.2020.1947.

107. Thapa SB, Mainali A, Schwank SE, Acharya G. Maternal mental health in the time of the COVID-19 pandemic. Acta Obstet Gynecol Scand. 2020, July 1;99(7):817–8. https://doi.org/10.1111/aogs.13894.

108. Choi KR, Records K, Low LK, Alhusen JL, Kenner C, Bloch JR, et al. Promotion of maternal–infant mental health and trauma-informed care during the COVID-19 pandemic. J Obstet Gynecol Neonatal Nurs. 2020;49(5):409–15. https://doi.org/10.1016/j.jogn.2020.07.004.

109. Holmes EA, O'Connor RC, Perry VH, Tracey I, Wessely S, Arseneault L, et al. Multidisciplinary research priorities for the COVID-19 pandemic: a call for action for mental health science. Lancet Psychiatry. 2020;S2215-0366(20):30168–71.

110. Rogers JP, Chesney E, Oliver D, Pollak TA, McGuire P, Fusar-Poli P, et al. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. Lancet Psychiatry. 2020;7(7):611–27. https://doi.org/10.1016/S2215-0366(20)30203-0.

111. Vindegaard N, Benros ME. COVID-19 pandemic and mental health consequences: systematic review of the current evidence. Brain Behav Immun. 2020;89:531–42. https://doi.org/10.1016/j.bbi.2020.05.048.

112. Cameron EE, Joyce KM, Delaquis CP, Reynolds K, Protudjer JLP, Roos LE. Maternal psychological distress & mental health service use during the COVID-19 pandemic. J Affect Disord. 2020;276:765–74. https://doi.org/10.1016/j.jad.2020.07.081.

113. Ceulemans M, Hompes T, Foulon V. Mental health status of pregnant and breastfeeding women during the COVID-19 pandemic: A call for action. Int J Gynecol Obstet. 2020;151(1):146–7. https://doi.org/10.1002/ijgo.13295.

114. Farrell T, Reagu S, Mohan S, Elmidany R, Qaddoura F, Ahmed EE, et al. The impact of the COVID-19 pandemic on the perinatal mental health of women. J Perinat Med. 2020;48(9):971–6. https://doi.org/10.1515/jpm-2020-0415.

115. Lebel C, MacKinnon A, Bagshawe M, Tomfohr-Madsen L, Giesbrecht G. Elevated depression and anxiety symptoms among pregnant individuals during the COVID-19 pandemic. J Affect Disord. 2020;277:5–13. https://doi.org/10.1016/j.jad.2020.07.126.

116. Huizink AC, Bartels M, Rose RJ, Pulkkinen L, Eriksson CJ, Kaprio J. Chernobyl exposure as stressor during pregnancy and hormone levels in adolescent offspring. J Epidemiol Community Health. 2008;62(4):e5.

117. Laplante DP, Brunet A, Schmitz N, Ciampi A, King S. Project ice storm: prenatal maternal stress affects cognitive and linguistic functioning in 5 1/2-year-old children. J Am Acad Child Adolesc Psychiatry. 2008;47(9):1063–72.

118. Seng JS, Rauch SA, Resnick H, Reed CD, King A, Low LK, McPherson M, Muzik M, Abelson J, Liberzon I. Exploring posttraumatic stress disorder symptom profile among pregnant women. J Psychosom Obstet Gynaecol. 2010;31(3):176–87.

119. Yehuda R, Engel SM, Brand SR, Seckl J, Marcus SM, Berkowitz GS. Transgenerational effects of posttraumatic stress disorder in babies of mothers exposed to the world trade center attacks during pregnancy. J Clin Endocrinol Metab. 2005;90:4115–8.

120. Foa EB, Meadows EA. Psychosocial treatments for posttraumatic stress disorder: a critical review. In: Spence J, Darley JM, Foss DJ, editors. Annual review of psychology, vol. 49. Palo Alto, CA: Annual Reviews; 1997. p. 449–80.

121. Cirino NH, Knapp JM. Perinatal posttraumatic stress disorder: a review of risk factors, diagnosis, and treatment. Obstet Gynecol Surv. 2019;74(6):369–76. https://doi.org/10.1097/OGX.0000000000000680.

122. Muzik M, Rosenblum KL, Alfafara EA, Schuster MM, Miller NM, Waddell RM, et al. Mom power: preliminary outcomes of a group intervention to improve mental health and parenting among high-risk mothers. Arch Womens Ment Health. 2015;18(3):507–21. https://doi.org/10.1007/s00737-014-0490-z.

123. Gunnar MR, Quevedo K. The neurobiology of stress and development. Annu Rev Psychol. 2007;58:145–73. https://doi.org/10.1146/annurev.psych.58.110405.085605.

124. Julian MM, Muzik M. Interventions to enhance mother-infant attachment in the context of trauma, depression, and substance abuse. In: Chandra P, Herrman H, Fisher J, Riecher-Rössler A, editors. Mental health and illness of women. Mental health and illness worldwide. Singapore: Springer; 2019. https://doi.org/10.1007/978-981-10-0371-4_29-1.

125. Julian MM, Muzik M, Rosenblum KL. Parenting in the context of trauma: dyadic interventions for trauma-exposed parents and their young children. In: Muzik M, Rosenblum KL, editors. Motherhood in the face of trauma. Springer; 2018. p. 131–50.

126. Bernard K, Dozier M, Bick J, Gordon MK. Intervening to enhance cortisol regulation among children at risk for neglect: results of a randomized clinical trial. Dev Psychopathol. 2015a;27(03):829–41. https://doi.org/10.1017/S095457941400073X.

127. Bernard K, Dozier M, Bick J, Lewis-Morrarty E, Lindhiem O, Carlson EA. Enhancing attachment organization among maltreated children: results of a randomized clinical trial. Child Dev. 2012;83(2):623–36. https://doi.org/10.1111/j.1467-8624.2011.01712.x.

128. Bernard K, Hostinar CE, Dozier M. Intervention effects on diurnal cortisol rhythms of child protective services–referred infants in early childhood. JAMA Pediatr. 2015b;169(2):112–9. https://doi.org/10.1001/jamapediatrics.2014.2369.

129. Bernard K, Lee AH, Dozier M. Effects of the ABC intervention on foster children's receptive vocabulary. Child Maltreat. 2017;22(2):174–9. https://doi.org/10.1177/1077559517691126.

130. Bernard K, Simons R, Dozier M. Effects of an attachment-based intervention on child protective services-referred mothers' event-related potentials to children's emotions. Child Dev. 2015c;86(6):1673–84. https://doi.org/10.1111/cdev.12418.

131. Bick J, Dozier M. The effectiveness of an attachment-based intervention in promoting foster mothers' sensitivity toward foster infants. Infant Ment Health J. 2013;34(2):95–103. https://doi.org/10.1002/imhj.21373.

132. Dozier M, Lindhiem O, Lewis E, Bick J, Bernard K, Peloso E. Effects of a foster parent training program on young children's attachment behaviors: preliminary evidence from a randomized clinical trial. Child Adolesc Soc Work J. 2009;26(4):321–32. https://doi.org/10.1007/s10560-009-0165-1.

133. Lewis-Morrarty E, Dozier M, Bernard K, Terracciano SM, Moore SV. Cognitive flexibility and theory of mind outcomes among foster children: preschool follow-up results of a randomized clinical trial. J Adolesc Health. 2012;51(2) https://doi.org/10.1016/j.jadohealth.2012.05.005.

134. Lind T, Bernard K, Ross E, Dozier M. Intervention effects on negative affect of CPS-referred children: results of a randomized clinical trial. Child Abuse Negl. 2014;38(9) https://doi.org/10.1016/j.chiabu.2014.04.004.

135. Sprang G. The efficacy of a relational treatment for maltreated children and their families. Child Adolesc Mental Health. 2009;14(2):81–8. https://doi.org/10.1111/j.1475-3588.2008.00499.x.

136. Yarger HA, Hoye JR, Dozier M. Trajectories of change in attachment and biobehavioral catch-up among high-risk mothers: A randomized clinical trial. Infant Ment Health J. 2016;37(5):525–36. https://doi.org/10.1002/imhj.21585.

137. Lind T, Raby KL, Caron EB, Roben CKP, Dozier M. Enhancing executive functioning among toddlers in foster care with an attachment-based intervention. Dev Psychopathol. 2017;29(02):575–86. https://doi.org/10.1017/S0954579417000190.

138. Lowell DI, Carter AS, Godoy L, Paulicin B, Briggs-Gowan MJ. A randomized controlled trial of child FIRST: a comprehensive home-based intervention translating research into early childhood practice. Child Dev. 2011;82(1):193–208. https://doi.org/10.1111/j.1467-8624.2010.01550.x.

139. Cicchetti D, Rogosch FA, Toth SL. Fostering secure attachment in infants in maltreating families through preventive interventions. Dev Psychopathol. 2006;18(3):623–49.

140. Cicchetti D, Toth SL, Rogosch FA. The efficacy of toddler-parent psychotherapy to increase attachment security in offspring of depressed mothers. Attach Hum Dev. 1999;1(1):34–66. https://doi.org/10.1080/14616739900134021.

141. Lieberman AF, Ghosh Ippen C, Van Horn P. Child-parent psychotherapy: 6-month follow-up of a randomized controlled trial. J Am Acad Child Adolesc Psychiatry. 2006;45(8):913–8. https://doi.org/10.1097/01.chi.0000222784.03735.92.

142. Lieberman AF, Van Horn P, Ghosh Ippen C. Toward evidence-based treatment: child-parent psychotherapy with preschoolers exposed to marital violence. J Am Acad Child Adolesc Psychiatry. 2005;44(12):1241–8. https://doi.org/10.1097/01.chi.0000181047.59702.58.

143. Lieberman AF, Weston DR, Pawl JH. Preventive intervention and outcome with anxiously attached dyads. Child Dev. 1991;62(1):199. https://doi.org/10.2307/1130715.

144. Toth SL, Maughan A, Manly JT, Spagnola M, Cicchetti D. The relative efficacy of two interventions in altering maltreated preschool children's representational models: implications for attachment theory. Dev Psychopathol. 2002;14(04):877–908. https://doi.org/10.1017/S095457940200411X.

145. Cassidy J, Woodhouse SS, Sherman LJ, Stupica B, Lejuez CW. Enhancing infant attachment security: an examination of treatment efficacy and differential susceptibility. Dev Psychopathol. 2011;23(1):131–48. https://doi.org/10.1017/S0954579410000696.

146. Hoffman KT, Marvin RS, Cooper G, Powell B. Changing toddlers' and preschoolers' attachment classifications: the circle of security intervention. J Consult Clin Psychol. 2006;74(6):1017–26. https://doi.org/10.1037/0022-006X.74.6.1017.

147. Huber A, McMahon CA, Sweller N. Efficacy of the 20-week circle of security intervention: changes in caregiver reflective functioning, representations, and child attachment in an Australian clinical sample. Infant Ment Health J. 2015;36(6):556–74. https://doi.org/10.1002/imhj.21540.

148. Cassidy J, Brett BE, Gross JT, Stern JA, Martin DR, Mohr JJ, Woodhouse SS. Circle of security–parenting: a randomized controlled trial in head start. Dev Psychopathol. 2017;29(02):651–73. https://doi.org/10.1017/S0954579417000244.

149. Cassidy J, Ziv Y, Stupica B, Sherman LJ, Butler H, Karfgin A, et al. Enhancing attachment security in the infants of women in a jail-diversion program. Attach Hum Dev. 2010;12(4):333–53. https://doi.org/10.1080/14616730903416955.

150. Sadler LS, Slade A, Close N, Webb DL, Simpson T, Fennie K, Mayes LC. Minding the baby: enhancing reflectiveness to improve early health and relationship outcomes in an interdisciplinary home-visiting program. Infant Ment Health J. 2013;34(5):391–405. https://doi.org/10.1002/imhj.21406.

151. LePlatte D, Rosenblum KL, Stanton E, Miller NM, Muzik M. Mental health in primary care for adolescent parents. Ment Health Fam Med. 2012;9(1):39–45.
152. Muzik M, Cameron HG, Fezzey A, Rosenblum KL. Motherhood in the face of trauma: PTSD in the childbearing year. Zero Three. 2009;29(5):28–33.
153. Muzik M, Schmicker M, Alfafara EA, Dayton CJ, Schuster MM, Rosenblum KL. Predictors of treatment engagement to the parenting intervention mom power among Caucasian and African American mothers. J Soc Serv Res. 2014;40(5):662–80. https://doi.org/10.1080/01488376.2014.917451.
154. Rosenblum KL, Lawler JM, Alfafara E, Miller N, Schuster M, Muzik M. Improving maternal representations in high-risk mothers: a randomized, controlled trial of the mom power parenting intervention. Child Psychiatry Hum Dev. 2017;(49, 3):372–84. https://doi.org/10.1007/s10578-017-0757-5.
155. Swain JE, Ho SS, Rosenblum KL, Morelen D, Dayton CJ, Muzik M. Parent–child intervention decreases stress and increases maternal brain activity and connectivity during own baby-cry: an exploratory study. Dev Psychopathol. 2017;29(02):535–53. https://doi.org/10.1017/S0954579417000165.
156. Swain JE, Ho SS, Rosenblum KL, Morelen D, Muzik M. Emotion processing and psychopathological risk in the parental brain: psychosocial intervention increases activity and decreases stress. J Am Acad Child Adolesc Psychiatry. 2016;55(10):S320–1. https://doi.org/10.1016/j.jaac.2016.07.350.
157. Clark R, Tluczek A, Brown R. A mother-infant therapy group model for postpartum depression. Infant Ment Health J. 2008;29:514–36. https://doi.org/10.1002/imhj.
158. Clark R, Tluczek A, Wenzel A. Psychotherapy for postpartum depression: a preliminary report. Am J Orthopsychiatry. 2003;73(4):441–54. https://doi.org/10.1037/0002-9432.73.4.441.
159. Julian M, Lawler J, Rosenblum K. Caregiver-child relationships in early childhood: interventions to promote well-being and reduce risk for psychopathology. Curr Behav Neurosci Rep. 2017;4:87–98. https://doi.org/10.1007/s40473-017-0110-0.
160. Lieberman AF, Ghosh Ippen C, Van Horn P. "Don't hit my mommy!": a manual for child-parent psychotherapy with young children exposed to violence and other trauma. Zero to Three; 2015.
161. Lieberman AF, Diaz MA, Castro G, Bucio GO. Make room for baby: perinatal child-parent psychotherapy to repair trauma and promote attachment. Guilford Publications; 2020.