

Review of Prenatal Maternal Mental Health and the Development of Infant Temperament

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ABSTRACT

Objective: To present a systematic review of literature and evaluate effects of prenatal maternal depression and anxiety on the development of infant temperament.

Data Sources: A literature search for studies published between January 1981 and January 2017 was undertaken using the electronic databases PsycINFO and PubMed, as well as reference lists from select resources. Search terms included variations on *infant temperament*, *prenatal/pregnancy*, *depression*, *mood*, and *anxiety*.

Study Selection: Studies were included if researchers measured psychological distress during pregnancy as indicated by maternal depression, anxiety, pregnancy-specific anxiety, or a combination of these factors in relation to the development of infant temperament (i.e., parent report or laboratory observations of temperament from 1 to 12 months). In total, 34 articles met inclusion criteria.

Data Extraction: Authors, year of publication, country of origin, sample information, methods, timing, and applicable results were summarized and compared across studies.

Data Synthesis: No standardized data analysis was conducted because of methodologic differences across the identified studies. Of the 34 identified studies, 22 included an indicator of depression (11 with significant results), 26 included an indicator of anxiety (14 with significant results), and 9 included an indicator of pregnancy-specific anxiety (7 with significant results).

Conclusion: Overall research outcomes were equivocal. Across studies on symptoms of depression and anxiety, findings related to the potential effect on infant temperament were mixed. Nonetheless, support for the role of prenatal psychological factors in the development of infant temperament emerged in a subset of population-based studies, including research to target the effects of pregnancy-specific anxiety. Future research is needed with greater consistency across studies with respect to methods (e.g., timing and assessment tools). Specific recommendations for nurses and providers include more routine screening and psychoeducation for expectant mothers about prenatal symptoms of depression and anxiety and about pregnancy-specific anxiety in particular.

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AWHONN

A synthesis of the literature on prenatal maternal mental health and infant temperament has important implications for future clinical research efforts and perinatal services.

temperament, influenced and modified over time via maturation and experience. Constitutional bases also include genetic influences (Posner et al., 2007) and epigenetic mechanisms linked with fetal programming effects (Monk et al., 2012; Werner et al., 2007). Reactivity encompasses responses to internal and external changes, such as arousability of affect, motor activity, and attention, whereas self-regulation is specific to neural and behavioral processes that serve to modulate reactivity (Rothbart and Bates, 2006; Rothbart and Derryberry, 1981).

Temperament difficulty during infancy (e.g., high reactivity and activity level) significantly increases child vulnerability for later disorders, including depression, anxiety, and attention deficit/hyperactivity disorder (De Pauw and Mervielde, 2010; Muris and Ollendick, 2005; Shaw et al., 2001). Infant temperament contributes to maternal postpartum depression, and greater negative emotionality exacerbates maternal symptoms (Beck, 2001; Dudley et al., 2001). Early temperament difficulties also affect mother-child interactions and maternal well-being. Mothers of highly reactive infants have more negative views of co-parenting and show greater noninvolvement and decreased visual and physical contact with their infants (Burney and Leerkes, 2010; van den Boom and Hoeksma, 1994). Thus, understanding the influence of prenatal depression and anxiety on the development of infant temperament has implications for multiple health service areas encountered by nursing professionals, including maternal and infant mental health and early parent-child interactions.

Objectives

Specific objectives of this review included the following aims: (a) to examine effects of prenatal maternal psychological distress on infant temperament from 1 to 12 months; (b) to describe similarities and differences across studies of infant temperament and maternal prenatal depressive symptoms, anxiety symptoms, or pregnancy-specific anxiety (Huizink et al., 2004); (c) to evaluate methodologic strengths and weaknesses among studies; (d) to identify gaps in the extant literature; and (e) to outline implications, conclusions, and areas for future research.

Methods

A systematic search for articles published from January 1981 through January 2017 was conducted in online databases PsycINFO and PubMed. The initial PsycINFO search included the terms *infant temperament*, AND *prenatal* OR *preg*, AND *depress* OR *mood*. Ninety-six articles were assessed for relevance based on established inclusion/exclusion criteria. Titles and abstracts were examined, and articles deemed relevant were subsequently reviewed. From the initial search, 19 articles were included for review (i.e., 77 were excluded). A second PsycINFO search replaced *depress* OR *mood* with *anxiety* OR *anxious* and resulted in 67 articles that met criteria: 37 were redundant, 21 were excluded, and 9 were included in the final review.

Identical search terms were used in a PubMed advanced search. The prenatal depression search yielded 121 results, with four novel articles meeting inclusion criteria. The search for anxiety-specific articles yielded 67 articles, all of which were redundant and/or did not meet inclusion criteria. A final set of searches replaced the terms *infant temperament* with *infant cry*, *infant negative affect*, and *infant positive affect*. Reference sections from review papers, meta-analyses, and notable studies were also examined. In total, 120 abstracts were reviewed, 67 full articles were assessed, and 34 articles were included in the final review (see Figure 1).

Inclusion and Exclusion Criteria

Study eligibility was determined based on the following inclusion criteria: (a) maternal depression, anxiety, or pregnancy-specific anxiety was measured in the prenatal period; (b) child temperament was assessed as an outcome at 1 to 12 months of age; and (c) studies were published in English in peer-reviewed journals. Studies were excluded if (a) prenatal stress (i.e., a focus on stressors or biological indicators of stress) was the primary independent variable, (b) effects of prenatal psychotropic medication use were of primary interest, (c) indications of psychological distress were specific to substance use and/or severe psychopathology (e.g., psychosis, bipolar disorder), and (d) infants were born preterm or had a NICU stay.

Coding of Studies

Each of the 34 articles in review were examined for sample size, country of origin, type of sample (e.g., community, clinical, population-based), type of

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