



Maternal depression and childhood obesity: A systematic review



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ABSTRACT

Objective. Maternal depression is prevalent and has been associated with parenting practices that influence child weight. In this systematic review we aimed to examine the prospective association between maternal depression and child overweight.

Methods. We searched four databases (PsycINFO, PubMed, Embase, and Academic Search Premier) to identify studies for inclusion. We included studies with a prospective design with at least one year follow-up, measuring maternal depression at any stage after childbirth, and examining child overweight or obesity status, body mass index z-score or percentile, or adiposity. Two authors extracted data independently and findings were qualitatively synthesized.

Results. We identified nine prospective studies for inclusion. Results were examined separately for episodic depression (depression at a single measurement occasion) and chronic depression (depression on multiple measurement occasions). Mixed results were observed for the relationship between episodic depression and indicators of child adiposity. Chronic depression, but not episodic depression, was associated with greater risk for child overweight.

Conclusions. While chronic depression may be associated with child overweight, further research is needed. Research is also needed to determine whether maternal depression influences child weight outcomes in adolescence and to investigate elements of the family ecology that may moderate the effect of maternal depression on child overweight.

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Introduction

Parents play an important role in determining child healthy lifestyles and are an important agent of change for child healthy weight (Golan and Crow, 2004). A range of parenting practices during infancy, childhood, and adolescence have been implicated in child weight development, including breastfeeding, early introduction of solid foods, physical activity parenting, screen-related parenting, and parental feeding practices (Edwardson and Gorely, 2010; Hoyos Cillero and Jago, 2010; Loprinzi et al., 2012; Rodgers et al., 2013; Sallis et al., 2000; Van der Horst et al., 2007; Weng et al., 2012). While parenting practices influence children's diet and physical activity behaviors, and in turn child obesity risk, little is known about the broader factors that can affect parenting and subsequently child behavioral and weight outcomes.

Theoretical models of child weight development in the obeseogenic environment of high-income countries have proposed that a range of individual, family and community contextual factors influence parenting practices in this area. Such factors include parental preferences, knowledge and beliefs, family social support, chronic stress, resource shortfalls, and neighborhood social capital (Davison et al., 2012; Loprinzi et al., 2012). While the factors that influence parenting for child healthy weight are many and varied (Davison et al., 2012), parent

mental health – and in particular maternal depression – may be one important element of the family ecology to consider as maternal depression has long been linked to parenting behaviors (Lovejoy et al., 2000).

Understanding the role of maternal depression in child weight development is particularly important given the prevalence of depression in both the postnatal period and beyond. A meta-analysis has estimated that up to 19% of women in developed countries experience an episode of depression in the three-month postnatal period (Gavin et al., 2005). In the 2001–2002 National Epidemiologic Survey of Alcohol and Related Conditions, approximately 10% of mothers of children <18 years of age experienced a major depressive disorder in the prior 12 month period (Ertel et al., 2011). Maternal depressive symptoms, such as negative affect and inactivity, may directly impact parenting for child healthy weight. Postnatal depression is associated with infant feeding practices, including earlier cessation of breastfeeding (Dennis and McQueen, 2009). In older children, parent depressive symptoms have been associated with physical activity parenting in low-income families (Lampard et al., 2013) and maternal depressive symptoms have been associated with increased child television viewing (Burdette et al., 2003; Conners et al., 2007; Hoyos Cillero and Jago, 2010) and lower child physical activity (Fernald et al., 2008). Despite the prevalence of maternal depression and its association with child health behaviors, its role in childhood obesity has yet to be adequately understood.

Two recent systematic reviews have investigated the relationship between perinatal depression, including depression during pregnancy and

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the postnatal period, and childhood obesity (Milgrom et al., 2012; Weng et al., 2012). In the most comprehensive review, three out of five studies documented a positive relationship between perinatal depression and child weight outcomes (including overall adiposity, central adiposity, overweight and obesity) between age 0 and 8 years (Milgrom et al., 2012).

As both review articles solely examined perinatal depression it is important to widen the scope of investigation to include maternal depression across the span of child development. Exposure to maternal depression at earlier and later stages of child development may be differentially associated with child weight outcomes and act via different mechanisms. Postnatal depression may influence child weight through earlier cessation of breastfeeding, impaired mother–infant feeding interactions and child feeding problems (Ertel et al., 2010). In contrast, maternal depression at later child developmental stages may influence child adiposity through parenting practices related to physical activity, food choices available in the home, and screen-related behavior. It is therefore important to examine the relationship between maternal depressive symptoms and child overweight across all child developmental stages.

Examining maternal depression across all child ages, we aimed to systematically review prospective studies to identify the association between maternal depression or depressive symptoms on excess child growth (aged 2 to 18 years), including child overweight or obesity status, BMI z-score or percentile, or alternative indicators of adiposity. We considered variation in this relationship across studies based on the timing of exposure to maternal depression, the age at which child weight outcomes were measured, the type of weight outcome examined, and income. We examined results separately for episodic depression (i.e., depression at a single point in time) and chronic depression (i.e., depression on multiple occasions). Our secondary aim was to identify evidence gaps and directions for future research to advance understanding of the role of maternal depression in childhood obesity.

Methods

This systematic review followed the reporting guidelines in the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) statement (Moher et al., 2009).

Search strategy

We searched four relevant databases (PsycINFO, PubMed, Embase, and Academic Search Premier) to identify eligible studies (last search on 2 January 2013). The following string of search terms was used in the database search: [(“maternal depression” OR “maternal depressive symptoms” OR “mother’s depression” OR “mother’s depressive symptoms” OR “parent depression” OR “parent depressive symptoms” OR “maternal postpartum depression” OR “maternal postpartum depressive symptoms” OR “maternal postnatal depression” OR “maternal postnatal depressive symptoms”) AND (child OR adolescent OR youth) AND (weight OR overweight OR obesity OR “body mass index” OR adiposity)]. To identify additional studies, we searched the reference lists of relevant review articles and research studies. We identified two hundred and fifty seven unique citations. Two authors independently examined the titles and abstracts of all citations. We excluded citations when both authors identified that the study did not meet inclusion criteria ($n = 242$). We retrieved the full-text articles of retained citations ($n = 15$) and two authors independently examined the full-text articles to identify studies that satisfied the inclusion criteria. Nine studies were included in the systematic review. The search strategy is illustrated in Fig. 1.

Study inclusion criteria

The scope of the review was limited to English language publications, published since 1980 with full text available. To qualify for inclusion, studies were required to: (i) report a quantitative analysis of the association between maternal depression or depressive symptoms (independent variable) and an indicator of excess child weight or adiposity (dependent variable), including overweight or obesity status, BMI z-score or percentile, or an alternative adiposity measure (e.g., skinfold thickness); (ii) measure maternal depression or

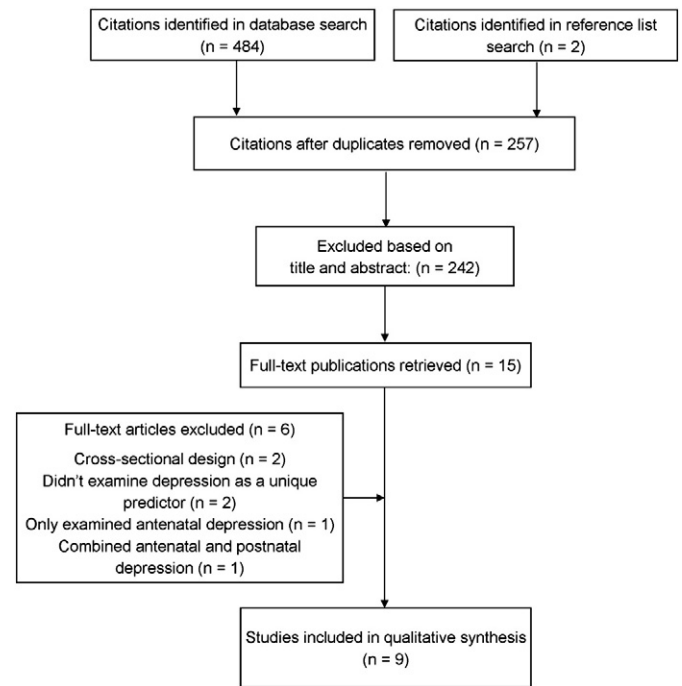


Fig. 1. Literature search strategy.

depressive symptoms with a validated questionnaire at any period following childbirth; (iii) include children aged between 2 and 18 years at outcome assessment; and (iv) use a prospective study design with minimum one year follow-up.

Data extraction

Two authors independently pilot-tested a data extraction form on two studies, comparing extracted data and revising the form as necessary. Two authors then independently extracted data from all included studies and discrepancies in data extraction were reconciled between authors. Authors extracted the following data: study setting and population; study design; sample size; length of follow-up; measurement of exposure and outcome; and results.

Quality assessment of included studies

We examined study quality using the Newcastle-Ottawa Quality Assessment Scale for cohort studies (Wells et al., 1996) (see Appendix 1). This scale assesses the quality of nonrandomized studies across three domains, including the selection of exposed and non-exposed groups, the comparability of groups, and outcome assessment. Two authors independently rated study quality and discrepancies were reconciled between the authors. We used quality ratings to identify potential sources of bias and methodological areas that were poorly addressed in the included studies.

Results

Summary of included studies

Following the search strategy outlined in Fig. 1, we identified nine prospective studies that examined the prospective association between maternal depression and child overweight ($n = 6$), obesity ($n = 2$), BMI z-score or percentile ($n = 5$), or alternative indicators of adiposity ($n = 3$). Studies were conducted in the US ($n = 5$), Denmark ($n = 1$), the Netherlands ($n = 1$), and Brazil ($n = 1$), and one study included multiple centers across Europe ($n = 1$). Three of the five US studies used data from the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development. Only two studies examined sex-specific results.

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