



Review

Obesity and anxiety during pregnancy and postpartum: A systematic review

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ABSTRACT

Background: Obesity and anxiety during the perinatal period are common and associated with poor health outcomes for the mother and the child. Despite the well-documented health risks of both pregnancy obesity and anxiety, associations between the two have rarely been explored. With this review we aim to provide a systematic overview of the current state of evidence concerning associations between ante- and postnatal anxiety and pregnancy obesity, excessive gestational weight gain, and postpartum weight retention.

Methods: We conducted a systematic literature search in PubMed, Web of Science, and PsychINFO.

Results: 13 Records matched our inclusion criteria. Five out of seven studies focusing on pregnancy obesity and anxiety suggest a positive association with ante- or postnatal anxiety. Surprisingly, no study examined anxiety disorders according to DSM and it remains unknown whether anxiety symptomatology reaches clinical relevance. Results from a small number of life-style intervention studies ($n=3$) suggest that interventions could benefit from a stronger focus on mental health. There were not enough studies on associations between excessive gestational weight gain ($n=2$) or postpartum weight retention ($n=3$) and anxiety making it difficult to draw conclusions about possible associations.

Limitation: The number of included studies is rather small and studies were included irrespective of the study quality which might limit the generalizability of the results.

Conclusions: The majority of the included studies suggest that obese pregnant women might constitute a subgroup that is especially vulnerable for comorbid anxiety and in need of targeted psychological support. However, further high-quality studies, particularly including anxiety disorders, are needed.

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Abbreviations: BAI, Beck Anxiety Inventory; BMI, Body Mass Index; DASS, Depression and Anxiety Stress Scale; DSM, Diagnostic and Statistical Manual of Psychiatric Disorders; GWG, gestational weight gain; IOM, Institute of Medicine; PPWR, postpartum weight retention; STAI, State Trait Anxiety Inventory

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1. Introduction

Obesity is increasingly common among women of reproductive age (Callaway et al., 2006; Ehrenberg et al., 2002; Vahratian, 2009). Depending on studied cohorts, prevalence rates of women who enter pregnancy obese vary from 7% to 38.5% (Briese et al., 2011; Callaway et al., 2006; Catalano and Ehrenberg, 2006; Guelinckx et al., 2008; Kerrigan and Kingdon, 2010; Kim et al., 2007; Raatikainen et al., 2006). Furthermore, childbearing contributes to the long-term development of obesity (Davies et al., 2010; Williamson et al., 1994). Excessive gestational weight gain (GWG) and postpartum weight retention (PPWR) have been discussed as important contributing factors (Gore et al., 2003; Siega-Riz et al., 2004). Excessive GWG, defined as weight gain in excess of the recommendations by the Institute of Medicine (IOM) (Institute of Medicine, 2009), is common with prevalence rates ranging from 33% to 60% (Hill et al., 2013; Olson, 2008; Webb et al., 2009). The physical health consequences of pregnancy obesity and excessive GWG are well documented. Pregnancy obesity is associated with an increased risk of perinatal and postnatal complications (e.g., gestational diabetes, preeclampsia, miscarriage (Frederick et al., 2012; Heslehurst et al., 2008; Raatikainen et al., 2006), preterm birth (Syngelaki et al., 2011)), medical complications in neonates (Blomberg and Källén, 2010; Catalano and Ehrenberg, 2006), and a higher risk of childhood obesity (Sen et al., 2012; Sullivan et al., 2011). Excessive GWG has been shown to be associated with increased birth weight and fetal growth (Siega-Riz et al., 2009) as well as childhood overweight (Nehring et al., 2013). Furthermore there is evidence that maternal obesity and high fat diet consumption during pregnancy also increase offspring vulnerability for mental or behavioral disorders (Sullivan et al., 2014, 2011). High PPWR refers to a failure to lose pregnancy-related weight after delivery. Therefore it contributes to the development of obesity among women in the childbearing age and inter-pregnancy weight gain (Bogaerts et al., 2014). It has also been found to be an important predictor of obesity in midlife (Rooney et al., 2005). If a woman is already obese at the start of pregnancy, excessive GWG and PPWR may maintain or even exacerbate obesity after delivery (Vesco et al., 2009). Thus, health problems associated with obesity may develop or persist after delivery (Abrams et al., 2000; Olson, 2008). While most research has focused on the physical health consequences of pregnancy obesity, less has been learned about mental health among obese pregnant women.

Mental disorders during pregnancy are common (Andersson et al., 2003; Vesga-López et al., 2008). A population-based Swedish study found a point prevalence of 14.1% for psychiatric disorders in the second trimester (Andersson et al., 2003). While to date, most research has been conducted in the field of pre- and postnatal depression (Grigoriadis et al., 2013; Vliegen et al., 2014), less is

known about anxiety during pregnancy (Andersson et al., 2006). Prevalence rates vary depending on the explicit time of the interview during pregnancy and the cohort studied (Goodman et al., 2014a; Ross and McLean, 2006). Goodman et al. (2014a) identified prevalence rates of anxiety disorders during pregnancy ranging from 4.4% to 39%. A large U.S. study based on a national survey among women with a known current or past-year pregnancy, reports a 12-month prevalence of 13% for anxiety disorders according to DSM-IV (Vesga-López et al., 2008). Symptomatic expressions of mental disorders are more common. In a prospective study by Lee et al. (2007), 54% exhibited antenatal anxiety in at least one trimester. Anxiety during pregnancy, measured on a symptom or diagnostic level, is associated with adverse effects on maternal and child health. It is associated with an increased risk of preterm birth, low birth weight (Ding et al., 2014; Martini et al., 2010), and shorter birth length (Broekman et al., 2014; Hosseini et al., 2009). It may also have an impact on fetal neurodevelopment influencing the child's cognitive and temperamental development (Dunkel Schetter and Tanner, 2012; Petzoldt et al., 2014) as well as negatively influence the bonding between mother and child (Martini et al., 2015). Furthermore, there is consistent evidence that prenatal anxiety disorders increase the risk for postpartum depression (Goodman et al., 2014a; Milgrom et al., 2008; Skouteris et al., 2009).

Studies from the general population provide evidence for a positive association between obesity and anxiety disorders (Barry et al., 2008; Becker et al., 2001; Garipey et al., 2010; Petry et al., 2008; Zhao et al., 2009). Despite the fact that pregnant women can be considered a special risk group, due to the particular risks associated with anxiety disorders and obesity during pregnancy, only little research has been conducted on this association among this group. A first indication for a positive association between pregnancy obesity and antenatal mental health problems, including anxiety, comes from Molyneaux et al. (2014). It remains unknown, however, if excessive GWG or PPWR – factors contributing to the long-term development of obesity after pregnancy – are associated with anxiety during pregnancy or postpartum. Furthermore, little information about associations between maternal weight and postpartum anxiety is available.

The aim of our systematic review was to draw a more detailed picture of the complex association between anxiety and maternal obesity across several stages during the perinatal period. Specifically, we aimed to (1) provide an extended overview of the association between pregnancy obesity and anxiety during pregnancy or postpartum, (2) examine associations between excessive GWG and ante- or postnatal anxiety, (3) examine associations between PPWR and ante- or postnatal anxiety, and (4) describe the effects of weight gain restriction and lifestyle programs during pregnancy on anxiety.

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