



Full Length Article

Maternal postpartum depressive symptoms and infant externalizing and internalizing behaviors

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ABSTRACT

Maternal postpartum depression has been shown to be one of the main predictors of externalizing and internalizing behaviors in toddlers and adolescents. Research suggests that presence of such behaviors can be observed as early as infancy. The current study uses longitudinal data from 247 mothers to examine the relationship between postpartum depressive symptoms at 8 weeks and the infant's externalizing and internalizing behaviors at 12 months. In unadjusted linear regression models, there were associations between postpartum depressive symptoms and infant externalizing behaviors ($\beta = 0.082$, $SE = 0.032$, $p = 0.012$) and internalizing behaviors ($\beta = 0.111$, $SE = 0.037$, $p = 0.003$). After controlling for potential confounding factors, including maternal age, race, education, home ownership, smoking status in the postpartum period, marital status, parenting stress, and happiness from becoming a parent, the associations between postpartum depressive symptoms and infant externalizing ($\beta = 0.051$, $SE = 0.034$, $p = 0.138$) and internalizing behaviors ($\beta = 0.077$, $SE = 0.040$, $p = 0.057$) were reduced and became non-significant. Furthermore, in these models the total amount of variance explained was 17.2% ($p < 0.0001$) for externalizing behaviors and 10.5% ($p < 0.01$) for internalizing behaviors; the only significant predictor of externalizing behaviors was maternal age ($\beta = -0.074$, $SE = 0.030$, $p = 0.014$), and of internalizing behaviors was white non-Hispanic ethnicity ($\beta = -1.33$, $SE = 0.378$, $p = 0.0005$). A combined effect of the confounding factors seems to explain the finding of no significant independent association between postpartum depressive symptoms and infant externalizing and internalizing behaviors.

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1. Introduction

Mothers play a pivotal role in the development and health of their infants (Grace, Evindar, & Stewart, 2003). Maternal postpartum depression is an important influence on development during infancy (Beck, 1995; Field, 1992; Murray, Cooper, & Philipp, 1998). Approximately 10–19% of women experience depression during the postpartum period (Banti et al., 2011; O'Hara & McCabe, 2013). Compared to women who have not recently given birth, childbearing women experience elevated levels of depressive symptoms but not clinical depression in the postpartum period (O'Hara, Zekoski, Philipps, & Wright,

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1990). Symptoms of postpartum depression are similar to those of depression at other times in the lifespan and include changes in sleeping patterns and appetite, feelings of worthlessness, crying spells, and anhedonia (O'Hara & McCabe, 2013; O'Hara et al., 1990). These symptoms and behaviors can influence the mother–infant interaction (Beck, 1998), creating interruption in the dyad that may lead to adverse infant developmental outcomes (Murray, Kempton, Woolgar, & Hooper, 1993), which in turn may persist into other childhood periods (e.g., toddlerhood), adolescence, and adulthood (Bernard-Bonnin, 2004; Reef, Diamantopoulou, van Meurs, Verhulst, & van der Ende, 2011).

Only a few studies have examined whether maternal postpartum depression or depressive symptoms influences 12-month old infant behaviors, which may be precursors to subsequent mental health, social, and cognitive problems (Dale et al., 2011; Edwards & Hans, 2015). This is important for informing interventions aimed at treating postpartum depression or improving the relationship between mother and infants, and staving off the potentially negative effects of postpartum depression on child development and health (Ammerman, Putnam, Teeters, & Van, 2014; Cluxton-Keller et al., 2014; Lieberman, Weston, & Pawl, 1991; Paris, Bolton, & Spielman, 2011). Consequently, this study examines the extent to which women's postpartum depressive (PPD) symptoms are associated with more frequent problematic infant externalizing and internalizing behaviors.

This study focuses on externalizing and internalizing behaviors of children 12 months' old because such behaviors can be measured in children this young (Briggs-Gowan, Carter, Bosson-Heenan, Guyer, & Horwitz, 2006; Van Zeijn, 2006), and research has found that these behaviors in children 18 months and older are associated with subsequent adverse adolescent and adult outcomes such as antisocial behavior and poor school performance (Brennan, Shaw, Dishion, & Wilson, 2012; Egeland, Yates, Appleyard, & Van Dulmen, 2002). Externalizing behaviors are characterized by actions on the external environment and include hyperactivity and aggression, and in young children are manifested by moving fast from toy to toy, unintentional injury to oneself or other children, and restlessness (Campbell, Shaw, & Gilliom, 2000; Deater-Deckard, Dodge, Bates, & Pettit, 1998; Liu, 2004a,b; Van Aken, Junger, Verhoeven, van Aken, & Dekovic, 2007). In contrast, internalizing behaviors lack the outwardly projected behaviors, more centrally affect one's inner psychological state, and are characterized by depressive, anxious, inhibited, and overly controlled behaviors (Eisenberg et al., 2001; Halligan, Murray, Martins, & Cooper, 2007; Kovacs & Devlin, 1998; Perle et al., 2013).

Factors associated with the development of problematic externalizing and internalizing behaviors in childhood include poverty, social stress, parenting stress, parental smoking during postpartum period, and parental age and education (Anselmi, Piccinini, Barros, & Lopes, 2004; Carter, Briggs-Gowan, & Davis, 2004; Deater-Deckard et al., 1998; Edwards & Hans, 2015; Liu, 2004a,b; Tharner et al., 2012; Yang, Decker, & Kramer, 2013). Most relevant here, maternal mental health, including depression and more depressive symptoms, has also been identified as a factor associated with problematic externalizing and internalizing behaviors in children and adolescents (Duggal, Carlson, Sroufe, & Egeland, 2001; Edwards & Hans, 2015; Najman, Bor, Andersen, O'Callaghan, & Williams, 2000).

While the negative impact of maternal postpartum depression on child behavior can be observed as early as 3 months of age (Field, 1992; Righetti-Veltema, Conne-Perreard, Bousquet, & Manzano, 2001), most research has focused on the association between maternal postpartum depression or depressive symptoms and subsequent behavioral outcomes in children of 18 months and older (Edwards & Hans, 2015; Essex, Klein, Miech, & Smider, 2001; Fanti & Henrich, 2010; Grace et al., 2003). Of these studies, many support the association between maternal postpartum depression or more depressive symptoms and externalizing and internalizing behaviors in children (Bagner, Pettit, Lewinsohn, & Seeley, 2010; Conroy et al., 2012; Edwards & Hans, 2015; Trapolini, McMahon, & Ungerer, 2007). However, many studies do not consider the confounding effect of the context in which the relationship between the depressed mother and the child takes place (Bagner et al., 2010; Carro, Grant, Gotlib, & Compas, 1993; O'Connor, Heron, Golding, Beveridge, & Glover, 2002; Trapolini et al., 2007); this context may be driving the relationship between PPD and internalizing and externalizing behaviors (Cicchetti, Rogosch, & Toth, 1998). For example maternal age, parental stress, and maternal education are shown to be associated with both maternal postpartum depression and children's externalizing or internalizing behaviors (Deater-Deckard et al., 1998; Field, 2010; Miyake, Tanaka, Sasaki, & Hirota, 2011; Saligheh, Rooney, McNamara, & Kane, 2014; Van der Voort et al., 2014). Further investigation is needed to examine the individual and combined impact of these confounding factors on the relationship between more postpartum depressive symptoms and infant behaviors. Therefore, the purpose of this study was to investigate the independent relationship between postpartum depressive symptoms and externalizing and internalizing behaviors in 12 months' old children, controlling for possible confounders including sociodemographics, smoking behavior during the postpartum period, parenting stress, and happiness level about being a parent.

2. Methods

2.1. Participants

Subjects were participants in a prospective cohort study conducted between 2005 and 2008. Mothers were recruited from the postpartum floor of a woman's university hospital located in a mid-size city in the northeastern part of the United States. Age 18 or older and English speaking were inclusion criteria for the study. Based on these eligibility criteria, 932 women were approached and 662 (71%) participated. After institutional review boards of the hospital and sponsoring university approved the study, participating women were interviewed within 24 h of giving birth. At approximately 8 weeks postpartum, a follow-up home interview was conducted with the participation rate of 79% ($n = 526$). At 12 months postpartum, a second follow-up

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