



Full length article

Goodness of fit between prenatal maternal sleep and infant sleep: Associations with maternal depression and attachment security



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ABSTRACT

The current study prospectively examined the ways in which goodness of fit between maternal and infant sleep contributes to maternal depressive symptoms and the mother-child relationship across the first years of life. In a sample of 173 mother-child dyads, maternal prenatal sleep, infant sleep, maternal depressive symptoms, and mother-child attachment security were assessed via self-report, actigraphy, and observational measures. Results suggested that a poor fit between mothers' prenatal sleep and infants' sleep at 8 months (measured by sleep diary and actigraphy) was associated with maternal depressive symptoms at 15 months. Additionally, maternal depression mediated the association between the interplay of mother and infant sleep (measured by sleep diary) and mother-child attachment security at 30 months. Findings emphasize the importance of the match between mother and infant sleep on maternal wellbeing and mother-child relationships and highlight the role of mothers' perceptions of infant sleep.

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1. Introduction

Disruptions in sleep are a nearly universal stressor following the birth of a baby. Over the first weeks and months of life, infants wake regularly across day and nighttime. By 6–9 months, sleep is more consolidated and most infants are able to “sleep through the night” (i.e., sleep 6–8 h without signaling their awakenings; Jenni & Carskadon, 2007; Jenni, Fuhrer, Iglowstein, Molinari, & Largo, 2005). However, infants display a great deal of variability in sleep patterns and self-soothing abilities (Goodlin-Jones, Burnham, Gaylor, & Anders, 2001), with estimates of approximately 20–25% exhibiting problematic sleep (Mindell, 1999). Accordingly, sleep problems are one of the most common concerns reported to pediatricians by parents (Anders, Halpern, & Hua, 1992; Ferber, 1985). As infant sleep develops, mothers typically experience sleep fragmentation and deprivation across the postpartum period (Hunter, Rychnovsky, & Yount, 2009; Lee, Zaffke, & McEnany, 2000). While evidence suggests that both infant and maternal sleep disruptions are independently associated with postpartum depression (e.g., Dennis & Ross, 2005), little is known about the effect of the interplay between maternal and infant sleep on maternal depression and the mother-child relationship across the first years of life. Moreover, although many have examined concurrent and predictive links between *postpartum* maternal and infant sleep (e.g., Tikotzky, Sadeh, Volkovich, Manber, Meiri, & Shahar, 2015), to our knowledge, little is known about the ways in which mothers' *typical* sleep patterns affect infant sleep processes and the emergence of postpartum depression. The current study examined the interactive effects of infants' sleep and mothers' typical prenatal sleep patterns and the ways in which the match between infant and mother

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sleep influences maternal depressive symptoms and later mother–child attachment security. Further, we explored possible differences in these processes between objective sleep measures and mothers' perceptions of their infants' sleep.

1.1. *Infant and mother sleep: Associations with postpartum depression and mother–infant relationships*

The potentially critical influence of maternal sleep disruption has become a recent area of interest for understanding predictive factors for the development and maintenance of postpartum depression. For many new mothers, sleep disturbance is common during pregnancy and the postpartum period. Objective sleep measures reveal decreases in deep sleep and sleep efficiency during pregnancy, and mothers continue to experience poorer sleep efficiency along with less total sleep time in the weeks after birth (Lee et al., 2000). On self-report measures, women report that they face increased night wakings, restless sleep, and daytime fatigue while pregnant (Mindell & Jacobson, 2000), and subsequently, women describe more fatigue and sleep disturbance in the postpartum period than during pregnancy (Gay, Lee, & Lee, 2004). Although these sleep disruptions occur for many women, poor maternal sleep quality, fatigue, and infant sleep difficulties (i.e., night wakings, time awake, maternal perceptions of poor infant sleep) during the postpartum period, both when measured subjectively with sleep diaries and objectively with actigraphy, are associated with postpartum depression (Dennis & Ross, 2005; Goyal, Gay, & Lee, 2009; Karraker & Young, 2007; Posmontier, 2008). Similarly, maternal depressive symptoms have been found to predict infant and toddler sleep problems (Armitage, Flynn, Hoffman, Vazquez, Lopez, & Marcus, 2009; Warren, Howe, Simmens, & Dahl, 2006). A challenge in research exploring associations between sleep and postpartum depression is determining the direction of effect (i.e., poor sleep increases depression versus depression causes poor sleep), but more likely, sleep during the postpartum period is a complex, transactional process, wherein sleep problems are both influenced by and contribute to maternal wellbeing (Sadeh, Tikotzky, & Scher, 2010).

Within many cultures and families, bedtime in infancy and childhood demands a parent–child interactive routine and a separation, and thus sleep and attachment would seem to be connected processes. However, there has been minimal empirical evidence supporting this association (Sadeh et al., 2010). Some research has identified links between mother-reported infant sleep problems and attachment security (Beijers, Jansen, Riksen-Walraven, & de Weerth, 2011; McNamara, Belsky, & Fearon, 2003; Scher & Asher, 2004), but not with objectively-measured infant sleep (Scher, 2001; Simard, Bernier, Bélanger, & Carrier, 2013), leaving questions about whether and how attachment and sleep are related. In contrast, the associations between maternal depression and attachment problems between a depressed mother and her child are more robust (Martins & Gaffan, 2000). Perhaps, then, maternal depressive symptoms provide the bridge by which sleep disruption affects attachment security; sleep problems may increase and maintain maternal depression during infancy, which then impedes mothers' and infants' ability to form a secure bond.

1.2. *Goodness of fit between infant and mother sleep patterns*

Goodness of fit calls attention to transactional processes in parent–child relationships and posits that a good fit between child characteristics and the parenting context contributes to positive child adjustment. Despite intuitive appeal, in the decades since Thomas and Chess originally formulated the construct of goodness of fit (Thomas & Chess, 1977; Thomas, Chess, & Birch, 1968), empirical support has lagged. Goodness of fit has been operationalized and measured using three approaches: (1) matching of behavior between parent and child, (2) matching of expectations of parents with children's behavior, and (3) appraisal of how children's behavior facilitates stress and coping of parents (Seifer, Dickstein, Parade, Hayden, Magee, & Schiller, 2014). The first measurement strategy, the behavior matching approach, may have particular relevance to the context of infant and maternal sleep patterns, as one would expect that a good fit between mothers' and infants' sleep behaviors would lead to better outcomes than a dyad with poorly fitting sleep patterns. For example, mothers who typically required more sleep prior to the birth of their infants may be better matched with infants who sleep more and/or have more predictable sleep habits, whereas, in contrast, mothers who slept less prenatally might be better able to adapt to an infant with highly fragmented sleep.

Jenni and O'Connor (2005) highlighted the potential importance of good fit between an individual child's sleep and the cultural (and, more directly, parental) expectations for sleep practices. Similarly, Sadeh, Anders, and colleagues embed infant sleep within a transactional model of cultural, environmental, and parent–child influences (Sadeh & Anders, 1993; Sadeh et al., 2010), which serves to emphasize the complexity of bidirectional influences on and by infant sleep. Although goodness of fit is typically discussed with a focus on child outcomes (i.e., in the case of sleep, well-matched child sleep characteristics with parental sleep expectations and behavioral sleep strategies are proposed to decrease child sleep problems), a broader conceptualization draws attention to the impact of parent–child fit on parental wellbeing, as well (Newland & Crnic, 2016). Specifically, poorly-matched infant and mother sleep patterns may contribute to maternal postpartum depression. Indeed, some of the mixed findings regarding the associations between postpartum sleep and depression (e.g., Gress, Chambers, Ong, Tikotzky, Okada, & Manber, 2010; Warren et al., 2006) may be accounted for by individual differences in mothers' sleep needs and the match with their infants' sleep patterns.

1.3. *The present study*

Although much is known about direct relations between infants' sleep and maternal psychopathology, the interplay of mothers' and infants' sleep on maternal wellbeing and mother–infant relationships deserves further consideration, to better

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