Check for updates

Received: 6 June 2024 | Accepted: 3 March 2025

DOI: 10.1111/jomf.13094

ARTICLE

Journal of Marriage and Family

Maternal sleep, coparenting quality, and parenting across the first 2 years postpartum

Liu Bai[1] | **Brian Crosby**[2] | **Douglas M. Teti**[3]

[1]School of Psychology, Capital Normal University, Beijing, China

[2]Department of Psychology, The Pennsylvania State University, Pennsylvania, USA

[3]Human Development and Family Studies, The Pennsylvania State University, Pennsylvania, USA

Correspondence
Douglas M. Teti, Human Development and Family Studies, 105 Health and Human Development Building, The Pennsylvania State University, University Park, PA 16802, USA.
Email: dmt16@psu.edu

Funding information
Eunice Kennedy Shriver National Institute of Child Health and Human Development, Grant/Award Number: R01 HD052809

Edited by: Spencer Olmstead

Abstract

Objective: This study examined the between- and within-person associations between maternal sleep patterns and parenting quality across the first 2 years postpartum, with a particular interest in the moderating role of coparenting quality.

Background: Parents are at high risk for poor sleep health during the postpartum period. However, little is known about the influences of parental sleep on parenting and whether the sleep-parenting linkage is qualified by family factors, such as coparenting relationships.

Method: The sample included 152 families with healthy, full-term infants. At 1, 3, 6, 9, 12, 18, and 24 months postpartum, maternal sleep was assessed via actigraphy, maternal parenting was observed during infant bedtime, and coparenting relationships were reported by mothers.

Results: Multilevel modeling revealed that low maternal variability in sleep duration and high perceived coparenting were each predictive of high parenting quality at the between-person level. Poorer sleep quality (i.e., longer wake after sleep onset, higher fragmentation) was predictive of lower parenting at the between-person level, only in mothers with lower coparenting perceptions than others. The combination of earlier sleep onset time and higher coparenting perceptions was predictive of higher parenting at both the within- and between-person levels.

Conclusion: The findings indicated that parenting may benefit the most when both the maternal sleep–wake system and coparenting system provide support and might be most compromised when both systems produce stress.

KEYWORDS
coparenting, family relations, parenting, sleep, transition to parenthood

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2025 The Author(s). *Journal of Marriage and Family* published by Wiley Periodicals LLC on behalf of National Council on Family Relations.

INTRODUCTION

The arrival of a new infant, encompassing both painful and joyful aspects, evokes dramatic changes in parents at multiple levels, from physiological to behavioral and relational levels (Kuersten-Hogan & McHale, 2021). Among these changes, one important biologically rooted, individual system that alters during this transition is parental sleep. Sleep is a multidimensional construct, with appropriate sleep timing, sufficient sleep duration, high sleep quality, and low sleep variability considered important elements of good sleep health (Buysse, 2014; Meltzer et al., 2012). It has been documented that parents, especially mothers, are at high risk for poor sleep health during the first few years postpartum (Gay et al., 2004; Hagen et al., 2013). Although parental sleep seems to recover over the postpartum period (Kang et al., 2002), there is evidence that some parents may suffer from significantly shorter sleep across the entire first 2 years of infants' life, compared with their non-parent counterparts (Hagen et al., 2013). Previous work also suggested that sleep problems in parents were at least partially due to their high caregiving demands in infancy and early childhood (e.g., Insana et al., 2014; Leonhard & Randler, 2009). However, little attention has been paid to the influences of parental sleep on parenting functioning. Less is known about whether the impact of sleep health on parenting is further dependent on other aspects of parents' social-ecological niche, although the interactions between multiple-level factors on parenting have been emphasized (e.g., Belsky, 1984).

Family is a dynamic system (Cox & Paley, 2003); both parents' individual and parenting systems are open to change to accommodate new family roles and meet new parenting demands. However, this dynamic nature is often overlooked in research examining determinants of parenting. Grounded in family systems theory (Cox & Paley, 2003) and bioecological perspectives (Belsky, 1984; Bronfenbrenner & Morris, 2006), this study aims to investigate the associations between maternal sleep patterns and quality of mothering across the first 2 years after childbirth, taking into account both their intra-individual fluctuations and inter-individual variations (Hoffman & Stawski, 2009). Drawing on the ecological model of coparenting (Feinberg, 2003), this study also investigates coparenting quality as a potential buffer of the dynamic linkages between maternal sleep and parenting quality. We hope our study can help researchers identify parents at risk and offer potential avenues for interventions facilitating effective parenting.

Parent sleep and parenting quality

During the first few years after childbirth, parenting competence requires parents to be aware of their child's cues and signals, interpret the signals accurately, and respond to these cues appropriately and contingently (Ainsworth et al., 1978). Thus, good attentional and emotional abilities are needed for parents to provide such sensitive parenting. However, the poor and insufficient nighttime sleep of parents can pose a challenge to their individual daily functioning, including depressive symptoms (Riemann et al., 2001), poor cognitive performance and negative attentional bias (Gobin et al., 2015), poor self-regulation (Palmer & Alfano, 2017), and mood disturbances (Varma et al., 2020). It is reasonable to expect that poor and insufficient parental sleep can potentially limit parents' performance during parent–child interactions through its ubiquitous effects on individual functioning associated with parenting quality.

However, only a handful of recent studies have investigated the linkage between parental sleep and parenting in mothers with young children. For example, our prior work has found that mothers who had poorer sleep health (e.g., later timing, greater day-to-day variability, shorter duration, poorer quality) were more likely to display poorer parenting quality during infant bedtime, when sleep patterns were assessed subjectively (i.e., via daily diaries; Bai et al., 2020) and objectively (i.e., via actigraphy; Bai et al., 2022). Besides bedtime parenting,

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Bai et al. (2022) also demonstrated that poorer quality of maternal nighttime sleep was predictive of poorer mothering quality in daytime free play. Similarly, King et al. (2020) reported that low sleep continuity assessed via actigraphy (e.g., longer wake after sleep onset, and more numbers of nighttime arousals) was predictive of decreases in maternal sensitivity across 10-min free play, whereas no association between subjective sleep variables and maternal parenting was found. Sleep–parenting linkages were also demonstrated in toddlerhood, such that poor maternal sleep assessed via actigraphy (i.e., a composite of short, late, and more variable sleep) was cross-sectionally and longitudinally predictive of low responsivity and low involvement observed during bedtime mother–child interactions (McQuillan et al., 2019, 2022). Another study from the same research group showed that more night wakings were associated with higher levels of mother-reported negative parenting only in mothers with lower executive function, but not in mothers with higher executive function (Chary et al., 2020).

Although previous research has indicated that poor sleep health increases the risk of parenting difficulties in mothers of young children, only one longitudinal study has investigated the within-person impacts of maternal sleep on the quality of parenting and found that changes in parenting were positively predicted by concurrent variations in maternal sleep health (i.e., variability in sleep period and fall asleep time) within one mother (Bai et al., 2020). However, Bai et al. (2020) only assessed maternal sleep variables with daily diaries. Previous research has demonstrated notable discrepancies between subjective diary-assessed and objective sleep variables (e.g., via actigraphy; Girschik et al., 2012; Matthews et al., 2018), which could be attributed to reporting biases. Also, inconsistent associations between sleep and parenting have been reported in one study including both subjective and objective sleep measurements, with the effect of sleep being significant only when it was assessed using actigraphy (King et al., 2020). Thus, investigations applying objective sleep measurements are essential to improve our comprehension of within-person relations between sleep and parenting. Building on the earlier within-person examination in early infancy (i.e., 1–6 months; Bai et al., 2020), the current study tested whether actigraphy-assessed sleep variables were predictive of parenting quality in mothers across the first 2 years postpartum. The multiple sleep and parenting assessments across five occasions enabled an examination of this research question at both the between- and within-person levels.

Coparenting as a predictor and moderator

Another limitation of prior work is that most studies only considered the main effect of maternal sleep, with one exception looking at the joint influence of parental sleep and cognitive capacities on parenting in mothers of toddlers (Chary et al., 2020). The significant interaction between parental sleep and executive function in predicting parenting indicated that sleep's influence on parenting functioning is not uniform (Chary et al., 2020). Given the long-lasting impact of parenting on child adjustment, research identifying factors that can mitigate or even eliminate the adverse influence of poor sleep on parenting is essential. Guided by family systems theory (Cox & Paley, 2003) and Feinberg's (2003) ecological model of coparenting, the current study was especially interested in examining mother-report coparenting quality as a "main predictor" and a potential buffer against the untoward influences of poor sleep health on mothers' parenting capacity.

Coparenting as a main predictor of parenting

Coparenting can be defined as the degree to which couples cooperate to accomplish their parenting responsibilities (Feinberg, 2003; McHale, 1995). The coparenting relationship excludes

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

other aspects of the interparental relationship (e.g., financial, sexual components) and only focuses on those related to child-rearing (Feinberg, 2003). The ecological model of coparenting addresses the central role of coparenting relationships in family functioning, including parenting (Feinberg, 2003). Specifically, high coparenting quality, characterized as high cooperation and support, as well as low undermining and conflict, can promote parenting capacities, whereas low coparenting quality may disrupt parental sensitivity. The association between coparenting and parenting functioning is also consistent with the "spillover" hypothesis from family systems theory (Cox & Paley, 2003), which postulates that different subsystems within the family can influence each other, and one family member's emotions and behaviors in one relationship (e.g., coparenting perceptions) can directly transfer to another relationship (e.g., parent–child subsystem).

Accordingly, research has linked coparenting with parenting competency concurrently in parents with young children. For example, Kim et al. (2021) demonstrated that poor perceptions of coparenting quality undermined parents' capability to be sensitive and responsive toward their infants across the first year postpartum. At 24 months, mothers who reported more frequent coparenting communication displayed more maternal supportive behaviors (e.g., sensitivity, positive regard) in mother–child interactions (Cabrera et al., 2012). Blandon (2015) found that parents with greater coparenting conflict reported more negative responses to their 2- to 5-year-old children's negative emotions concurrently. Similarly, several cross-sectional studies revealed that high perceptions of coparenting quality were concurrently related to parent-reported high positive (parental involvement) and low negative (e.g., harsh discipline) parenting in parents of preschoolers (Çetin & Demircan, 2022; Parkes et al., 2019).

The quality of coparenting relationships was also associated with subsequent levels of parenting quality in infancy and early childhood. For instance, Altenburger and Schoppe-Sullivan (2020) found that more supportive coparenting behaviors during triadic free play at 3 months were predictive of higher observed paternal parenting quality (e.g., sensitivity, engagement, warmth) at nine-month follow-ups. Similarly, in both fathers and mothers, perceived coparenting quality around 1 year of infant age was positively associated with observed responsive parenting (Lee et al., 2021) and reported parental involvement (e.g., play, tell stories; Fagan & Palkovitz, 2019; Lee et al., 2020; Wang et al., 2022) 2 years later. Although linkages between coparenting and parenting have been generally supported longitudinally, most research only examined coparenting on one single occasion (Altenburger & Schoppe-Sullivan, 2020; Lee et al., 2021). The few longitudinal studies with multiple waves of assessment of coparenting and parenting (two occasions in most cases) failed to differentiate between the between- and within-person effects of coparenting on parenting (Fagan & Palkovitz, 2019; Lee et al., 2020; Wang et al., 2022). The present study tended to fill this research gap by considering both coparenting and parenting as dynamic constructs that can change over the course of the first 2 years following childbirth. This study predicted changes in parenting quality from the concurrent variations in coparenting quality perceptions within one mother (i.e., the within-person associations), in addition to the between-person associations.

Coparenting as a moderator of linkages between sleep and parenting

Besides the "main" effect, the present study explored coparenting perceptions as a moderator of linkages between maternal sleep and parenting quality. This hypothesis was compatible with Feinberg's (2003) ecological model of coparenting, which proposes coparenting as a central moderator that can protect family outcomes from the detrimental effects of risk factors. In a similar vein, Belsky's (1984) parenting model argues that parenting is multiply determined, with supports from one domain (e.g., interparental system) serving to temper the stresses produced by another (e.g., parental characteristics). Parenting quality is expected to be highest when both

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

parents' individual and interparental subsystems (e.g., parental sleep and coparenting) function in the supportive mode, and at its lowest when both are stressful (Belsky, 1984).

Although research examining the interactive effect of parental sleep and coparenting on parenting quality was limited, this idea can be supported by empirical evidence showing that coparenting quality moderated the effects of other individual or family factors on parenting outcomes. Consistent with Feinberg's (2003) ecological model of coparenting, several studies have shown that the relations between risk factors and parenting were only significant in the context of poor coparenting relationships. For example, in parents of 4- to 5-year-old children, higher parental psychological distress was associated with less warm and responsive parenting reported by parents with lower coparenting perceptions (McRae et al., 2021). In contrast, no significant effect of parental distress on parenting was revealed in parents with high perceived coparenting quality (McRae et al., 2021). Similarly, mothers' neuroticism was positively predictive of their nine-month harsh intrusiveness only in families with high levels of observed undermining coparenting at 3 months (Zvara et al., 2019). The *dual-risk pattern* of interaction (Sameroff, 1983) that emerged from these studies was also in line with Belsky's (1984) theoretical framework suggesting that the lowest parenting competence is expected to be observed when parents experienced stress at both individual and family levels. Notably, Belsky's (1984) parenting model also posits an alternative interaction in which parents are likely to show the highest parenting competence when different subsystems (e.g., individual and interparental) operate together in a supportive mode. This interactive pattern was discussed as the *protective-reactive moderating process* in resilience research (Luthar et al., 2000), highlighting the promotion of well-being rather than the prevention of risks. Several empirical studies from the broader literature supported this hypothesis by showing that better marital quality (Merrifield & Gamble, 2013) and less negative temperament in infants (Solmeyer & Feinberg, 2011) were linked to higher parenting self-efficacy only in mothers who reported higher supportive (lower undermining) coparenting but not in those with poorer coparenting perceptions.

Taken together, two patterns of interaction have been reported by prior research examining coparenting as a moderator of the effects of contextual or individual factors on parenting outcomes: the dual-risk pattern (Sameroff, 1983) and the protective-reactive pattern (Luthar et al., 2000) both of which were consistent with Belsky's (1984) process model of parenting. The present study explored whether coparenting quality and parental sleep interactively predict parenting quality across the first 2 years of infants' lives. In light of previous theoretical and empirical evidence, it was anticipated that healthy sleep might facilitate optimal parenting, especially when coparenting quality was high. Sleep problems, on the other hand, might undermine parenting capacity, especially when parents experienced poor coparenting quality.

The present study

The current longitudinal study aimed to explore the joint influences of maternal sleep and coparenting perceptions on maternal parenting quality across the first 2 years postpartum. Mothers were the focus of our study as they are typically considered the primary caregivers, taking greater caregiving responsibilities than fathers (Sayer, 2016). In infancy, mothers also experience more disrupted nighttime sleep (Gay et al., 2004) and are likely to have a more salient understanding of coparenting relationships than fathers (Feinberg et al., 2012). The current study is particularly interested in whether linkages between maternal sleep and parenting quality would be qualified by the levels of coparenting quality that the mother experienced. It contributes above and beyond our earlier work in that it considers both the between-person differences and within-person dynamics of relations among actigraphy-assessed sleep, quality of coparenting, and parenting across the infants' first 2 years. Sleep variables from multiple sleep dimensions (i.e., timing, quality, quantity, variability) were included to provide a more

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

comprehensive examination of the interactive effects of sleep and coparenting quality on parenting in mothers of infants.

The following research questions and hypotheses were tested at both the between- and within-person levels:

1. Could maternal actigraphy-assessed sleep be predictive of parenting quality? It was hypothesized that at the between-person level, mothers with poorer sleep health (i.e., later, shorter, poorer, and more variable sleep) would display poorer quality of parenting than mothers with better sleep health. At the within-person level, it was hypothesized that when a mother's sleep health decreases, relative to her own average across time, her parenting quality would be rated lower than usual, whereas on occasions when the mother had greater increases in sleep health, her parenting quality would also increase.
2. Would maternal coparenting perceptions be associated with parenting quality? At the between-person level, it was hypothesized that mothers with better coparenting quality would display a higher quality of parenting than others. At the within-person level, it was hypothesized that increases or decreases in the mother's perceptions of coparenting quality, relative to her own average across time, would be associated with increases or decreases in her parenting quality.
3. Would coparenting perceptions moderate the associations between maternal sleep health and parenting quality? It was hypothesized, on one hand, that good (increased) sleep health might facilitate optimal parenting, especially when the quality of coparenting was high (increased). On the other hand, poor (decreased) sleep health might undermine parenting quality, especially when parents experienced poor (decreased) coparenting quality; in other words, high (increased) coparenting quality may buffer this detrimental effect of poor (decreased) sleep on parenting.

METHOD

Participants

One hundred and sixty-seven families with healthy, full-term infants participated in a longitudinal project focusing on family relationships, parenting, and infant development. All procedures were approved by the University's institutional review board. Families were initially contacted in two local hospitals in central Pennsylvania within 24–48 h after delivery. Families expressing an interest were first visited and consented to when their infants were 1 month old (46.7% boys; $M_{age} = 1.21$, $SD = 0.16$). Subsequent visits were conducted when infants were 3, 6, 9, 12, 18, and 24 months. Data in the project were collected during 2009–2014. Fifteen families were excluded from the current study because they provided no data on at least one of the variables of interest (i.e., maternal coparenting perceptions, parenting quality, and sleep) at any time point. Therefore, 152 mothers with infants were considered in our analyses. The 15 excluded families were compared with the final sample on socio-demographic variables and all study variables. There was no difference between the two samples with only a few exceptions: compared with mothers in the final sample, the excluded mothers had lower parenting quality at 24 months, later fall asleep time at 1, 9, 12, 18, and 24 months, shorter sleep duration at 1, 6, and 12 months, and were more likely to co-sleep with their infants at 9 months. Also, mothers in the excluded families had lower educational levels and were less likely to have live-in partners than those in the final sample.

In the final sample, maternal age ranged from 18 to 43 for mothers ($M = 29.62$, $SD = 5.21$) at recruitment. Most mothers were married and living with their partners (86.2%) at the 1-month visit, and 35.5% were first-time mothers. Compared to females older than 25 in

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

the general population of Pennsylvania, a higher percentage of mothers in our sample had bachelor's degrees or higher (62.5% in our sample vs. 27.8% from the general population, U.S. Census Bureau, 2014a). In the final sample, 84% of mothers were White (comparable with the 82% from the general population of Pennsylvania, U.S. Census Bureau, 2014c), 5% were Latino, 3% were African American, 3% were Asian American, 3% self-identified as "Others," and 1% did not provide this information. Family yearly income ranged from $9600 to $350,000 at recruitment in the final sample, with a median score of $65,000, which reflects the family income of Pennsylvania's population (i.e., $67,296, U.S. Census Bureau, 2014b). Detailed socio-demographic information is available in Table S1.

Overall procedure

Home visits took place when infants were at 1, 3, 6, 9, 12, 18, and 24 months of age. Maternal nighttime sleep–wake behaviors were recorded using the wearable Respironics AW-64 actiwatches (Philips/Respironics, Inc.) for seven consecutive days at each time point. On each occasion, parent–infant interactions during infant bedtime were continuously recorded at the family's home using video equipment, and maternal parenting quality was coded offline. In addition, mothers completed questionnaires to report socio-demographic information, their depressive symptoms, and coparenting perceptions on each occasion.

Measures

Socio-demographic information

On each occasion, several socio-demographic characteristics were provided by mothers, including infant sex, infant age (in months), maternal age, partner status, and educational level (1 = "*attended high school but did not graduate*"; 8 = "*graduated with a doctoral, law, or medical degree*"). In addition, information on yearly family income and the number of family members living in the household were obtained from parents when infants were at 1 and 12 months of age. For each family, the income-to-needs ratio (INR) was then computed separately at the 1- and 12-month visit by dividing the annual income by the federal poverty line for that family size. The correlation between INRs at 1 and 12 months was high in the final sample ($r = .95$, $p < .001$). Thus, an average score across the two occasions was used in the analyses to capture the family's economic situation.

Bedtime parenting quality

During each home visit, project staff set up video and audio recording equipment (i.e., Bosch Divar XF 8-Channel Digital Versatile Recorder) in the family's home to record one night of parent-infant interactions during the infant's bedtime. Specifically, infrared Color CCD night-vision security cameras made by ARM Electronics (Model No. C420BCVFIR) and Channel Vision microphones (Model No. 5104-MIC) were applied to collect video and audio data. Up to four cameras were placed for each family in the rooms where the parent-infant bedtime interactions typically happened and where the infant slept (see Kim & Teti, 2014 for more details). Families were instructed to turn on the recording system about 1 h before the infants' bedtime began to continuously capture the entire infant bedtime and night interactions. Maternal parenting during infant bedtime was the focus of our study. It has been argued that infant bedtime, as a part of daily routines, can provide the longest, well-representative snapshots of the natural

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

and spontaneous interactions between parents and their infant (Teti et al., 2010), and may have better ecological validity (Gardner, 2000) than (semi)structured interactions which are relatively brief (e.g., free play). Moreover, bedtime interactions can be stressful, as parents are required to down-regulate their children's arousal levels to facilitate sleep. Compared to non-stressful interactions, infant bedtime provides a context in which meaningful inter- and intra-individual differences in parenting quality are more likely to be observed (Teti, in press). Two certified coders, who were blinded to other information in the study, rated maternal parenting quality using the Emotional Availability Scales (EAS; Biringen et al., 1998). The EAS consists of four parental dimensions, including sensitivity (9-point scale), structuring (5-point scale), non-intrusiveness (5-point scale), and non-hostility (5-point scale), and has shown adequate validities in previous research with even one-time observation (Biringen, 2000; Moehler et al., 2007). Given that the EAS was typically coded in play contexts, some adaptations to the bedtime contexts were made (Teti et al., 2010). Specifically, high sensitivity was rated when mothers could be aware of the infant's cues, and interpret and respond to these cues accurately, contingently, and appropriately. Mothers were scored as high in structuring when they applied quiet, soothing routines that gently prepared the infant for sleep. Mothers were judged as high non-intrusiveness when they could recognize the infant's needs and avoid intrusive interactions (e.g., high-volume talk) during bedtime. Finally, maternal non-hostility was high when mothers regulated their emotions well and showed no covert or overt hostility. On each occasion, a separate score was provided for each dimension and was rescaled using the percent of maximum possible (POMP) method (Cohen et al., 1999) to account for differences in the Likert scales. The POMP-transformed score was calculated with the following formula: $100 \times (\text{observed score} - \text{scale minimum})/(\text{scale maximum} - \text{scale minimum})$, with possible scores ranging from 0 to 100. A composite score of maternal emotional availability (EA) was calculated by averaging the POMP-transformed scores of all four dimensions, with higher scores indicating higher maternal EA (i.e., better parenting quality). The interrater reliability was computed using intraclass correlation coefficients (ICC) based on absolute agreement with 42 families (12% of the sample) across time points, and high reliabilities were found (ICCs = .88–.99) at all time points. The internal reliability was also acceptable across all occasions in the current sample (αs = .78–.90).

Maternal nighttime sleep

At 1, 3, 6, 9, 12, 18, and 24 months, maternal sleep was obtained across seven consecutive days using the Respironics/MiniMitter AW-64 actiwatch. Mothers wore the actiwatch on their wrists to record their physical activity throughout the night for 7 consecutive days. Data were collected using a 1-min epoch sampling and medium sensitivity threshold (40 activity counts). After the home visit, the recordings were read using Actiware (Version 5.59) software, and maternal sleep and night wakings were scored with the Sadeh algorithm (Sadeh et al., 1994). Specifically, sleep onset was determined as the start of the first of at least three consecutive epochs of inactivity, and sleep offset was defined as the last minute of the last five or more continuous epochs of inactivity.

Five sleep parameters reflecting four distinct dimensions (i.e., timing, quality, quantity, variability) of sleep were calculated on each occasion to get a comprehensive sampling of maternal sleep patterns. Specifically, the maternal average *sleep onset time* across the 7 days was computed as the sleep timing indicator. Average *sleep fragmentation* (percentage of inactive sleep time across the designated period between sleep onset and offset time) and *wake after sleep onset* (WASO; total awake time from sleep onset to sleep offset) across the seven nights were calculated as indicators of sleep quality. In addition, maternal sleep duration on each night was calculated as the elapsed time from sleep onset time to offset time subtracted by WASO. The

average *sleep duration* across the seven nights of data collection was utilized to capture maternal sleep quantity, whereas the *variability in sleep duration* (VSD; the standard deviation of sleep duration across the seven nights) was computed as the sleep variability indicator. Each sleep index was calculated when at least five nights of sleep data were provided (Acebo et al., 1999; Sadeh, 2011). In the final sample, 61%–94% of mothers provided at least 5 days of data across 1–24 months.

Coparenting quality

At each time point, coparenting quality was measured via the Coparenting Relationship Scale (CRS; Feinberg et al., 2012), in which the mother evaluated the extent to which she and her partner effectively collaborated as a child-rearing team. This 35-item questionnaire (e.g., "My partner and I have the same goals for our child.") taps mothers' perceptions of coparenting quality in five positive and two negative dimensions. The positive dimensions include Agreement (four items), Closeness (five items), Support (six items), Endorse Partner's Parenting (seven items), and Division of Labor (two items). The two negative dimensions contain Undermining (loading negatively; six items) and Exposure to conflict (loading negatively; five items). A 7-point Likert scale was applied to all items of the CRS. Specifically, the five items in the exposure to conflict subscale have a response scale from 1 = "*never*" to 7 = "*very often*"; while all other items have a response scale from 1 = "*not true of us*" to 7 = "*very true of us*." High reliability and validity of the CRS were reported (Feinberg et al., 2012). In the current study, an index of the overall quality of coparenting was created by subtracting the sum score of items under the negative dimensions from the sum score of items under positive dimensions and dividing by the total number of items. Higher scores reflected higher maternal perceptions of coparenting quality. The internal reliabilities were high in the final sample across all time points (αs = .92–.96).

Potential covariates

Child sex, sleep arrangements, family INR, maternal age, educational level, and partner status were considered as potential covariates based on previous research (e.g., Booth et al., 2018; Teti et al., 2016). Child sex (0 = *boy*; 1 = *girls*), maternal age, and educational level were reported by mothers on the first occasion. Mothers also reported partner status (0 = "*with live-in partner*" vs. 1 = "*no live-in partner*"), and infant sleep arrangements on all occasions. Information on infant sleep arrangements was obtained via one item ("Where does your baby usually sleep at night?") from the Sleep Practices Questionnaire (SPQ; Goldberg & Keller, 2007). A categorical variable consisting of four categories was created to identify infant sleep arrangements, namely solitary sleep (i.e., "infant slept in a separate room from parents"), bed-sharing (i.e., "infant slept in the same bed as parents"), room-sharing (i.e., "infant slept in the room but not in the same bed as parents"), and combination (i.e., "infant's sleep arrangement varied across nights"). Three dummy variables were then computed with solitary sleep as the reference group, and the dummy variables will be utilized in the analyses. In the final sample, the proportion of infants in the solitary sleep group was 27% to 70% across 1–24 months.

Plan of analysis

All analyses were performed using R (version 4.3.1). In preliminary analyses, descriptive statistics (e.g., means and standard deviations) and bivariate correlations among all study variables

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

were conducted. Associations between potential covariates and the outcome variables (e.g., maternal EA) were examined to determine whether these variables needed to be controlled in the primary analysis. To handle the nested nature of the data (i.e., repeated measures within each mother), multilevel modeling (MLM) was applied in the primary analyses using "nlme" package (Pinheiro et al., 2021). In the final sample, missing rates of all study variables and potential covariates ranged between 0 and 45%. The Little's MCAR test was significant, $\chi^2(4061) = 4238.5$, $p = .026$, but the normed chi-square was acceptable ($\chi^2/df = 1.04$; Ullman, 2007). Thus, our data were likely missing at random, and maximum likelihood estimation allowing for imbalance in the structure will be applied to accommodate missing outcomes.

The primary analyses were started with unconditional means models of the outcome and all predictors to assess the ICCs, reflecting the percentage of total variance in each variable of interest that was accounted for by between-person differences. Then, an unconditional growth curve model of maternal EA across 1 to 24 months was conducted to examine the average trajectory of maternal EA over time. Infant age was centered at 1 month to obtain the initial levels of EA. The model with nonlinear fixed and random effects of infant age (i.e., quadratic effect) was conducted first. However, model comparisons suggested that this model was no better than the model with linear effects of infant age only, and thus the nonlinear age parameters were trimmed. The equation for the final unconditional growth model is as below, where t indexed the seven occasions (i.e., 1, 3, 6, 9, 12, 18, and 24 months), and i indexed the individuals:

Level 1: Maternal $EA_{ti} = \beta_{0i} + \beta_{1i}$ (Infant age_{ti}) + β_{2i} ($Covariates_{ti}$) + e_{ti}.

Level 2: $\beta_{0i} = \gamma_{00} + \gamma_{01}$ ($Covariates_i$) + u_{0i}

$$\beta_{1i} = \gamma_{10} + u_{1i}$$

$$\beta_{2i} = \gamma_{20}$$

For the fixed effects, γ_{00}, and γ_{10} represented the initial level and change of maternal bedtime EA across time. For the random effects, σ^2_{u0}, and, σ^2_{u1} reflected the variances in levels and changes in bedtime EA, respectively, and σ^2_e estimated the residual variance after the covariates and infant age were taken into account.

Next, the conditional models with maternal sleep, coparenting quality, and covariates were conducted to examine the main research questions. A separate model was conducted for each sleep index. According to previous recommendations (Hoffman & Stawski, 2009), the between- and within-person effects of maternal sleep and coparenting quality were separated by person-mean centering these time-varying variables (i.e., centered the variable by subtracting each mother's own variable mean). The basic equations are as below:

Level 1:

$$\begin{aligned}\text{Maternal EA}_{ti} = {} & \beta_{0i} + \beta_{1i}(\text{Infant age}_{ti}) + \beta_{2i}(\text{Within} - \text{person maternal sleep}_{ti}) \\ & + \beta_{3i}(\text{Within} - \text{person coparenting}_{ti}) + \beta_{4i}\Big(\text{Within} - \text{person maternal sleep}_{ti} \\ & \times \text{Within} - \text{person coparenting}_{ti}\Big) + \beta_{5i}\Big(\text{Within} - \text{person maternal sleep}_{ti} \\ & \times \text{Infant age}_{ti}\Big) + \beta_{6i}(\text{Within} - \text{person coparenting}_{ti} \times \text{Infant age}_{ti}) + \beta_{7i}\Big(\text{Within} \\ & - \text{person maternal sleep}_{ti} \times \text{Within} - \text{person coparenting}_{ti} \times \text{Infant age}_{ti}\Big) \\ & + \beta_{8i}(\text{Covariates}_{ti}) + e_{ti}.\end{aligned}$$

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Level 2:

$$\beta_{0i} = \gamma_{00} + \gamma_{01}(\text{Average maternal sleep}_i) + \gamma_{02}(\text{Average coparenting}_i) + \gamma_{03}(\text{Average maternal sleep}_i \times \text{Average coparenting}_i) + \gamma_{03}(\text{Covariates}_i) + u_{0i}.$$

$$\beta_{1i} = \gamma_{10} + \gamma_{11}(\text{Average maternal sleep}_i) + \gamma_{12}(\text{Average coparenting}_i) + \gamma_{13}(\text{Average maternal sleep}_i \times \text{Average coparenting}_i) + u_{1i}.$$

$$\beta_{2i-8i} = \gamma_{20-80}.$$

Specifically, the person-mean centered variables were included at level-1 to examine whether fluctuations in maternal sleep and coparenting quality were associated with the fluctuations in maternal bedtime EA concurrently (γ_{20} and γ_{30} for the within-person effect of maternal sleep and coparenting, respectively). Each mother's average sleep and coparenting scores across all time points were also included at level-2 to examine whether mothers with higher/lower maternal sleep health and coparenting quality, compared with others, had higher/lower maternal bedtime EA. At both the between- and within-person level, the interaction between maternal sleep and coparenting was also included to examine the moderating role of coparenting on linkages between maternal sleep and EA (γ_{03} and γ_{40} for the between- and within-person interaction, respectively). In addition, the 2-way and 3-way interactions with infant age were included to explore whether the effect of maternal sleep (the within-person effect: γ_{50}; the between-person effect: γ_{11}), coparenting (the within-person effect: γ_{60}; the between-person effect: γ_{12}) and their interactions (the within-person effect: γ_{70}; the between-person effect: γ_{13}) varied with infant age. Non-significant interactions were trimmed from the final models. Significant interaction terms were further interpreted with a simple slope test at relatively high and low levels (±1 *SD* from the sample mean) of the moderator (i.e., coparenting). All other variables were grand-mean centered before being included in the analyses, and categorical covariates were dummy-coded.

RESULTS

Preliminary analyses

Table S2 presented the means, standard deviations, and zero-order correlations for all study variables. Relations between potential covariates (i.e., infant sex, sleep arrangements, family INR, maternal age, educational level, and partner status) and maternal EA were examined. Independent samples t-tests suggested that mothers of boys showed higher bedtime EA than mothers of girls at 3 and 9 months (ps < .05). Mothers with live-in partners had higher bedtime EA than those without live-in partners at 18 months ($t[84] = -3.41$, $p < .001$). In addition, a one-way analysis of variance revealed significant associations between sleep arrangements (i.e., solitary sleep, bed-sharing, room-sharing, and combination) and EA at 3, 6, 9, and 24 months (ps < .05). Bivariate correlations suggested family INR (rs = .21–.44) and maternal education (rs = .27–.50) were significantly correlated with maternal EA on all occasions (ps < .05). Maternal age was linked with bedtime EA at 1, 9, 18, and 24 months (rs = .27–.39, ps < .01). In sum, infant sex, sleep arrangements, family INR, maternal age, educational level, and partner status were included as covariates in the primary analyses.

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Primary analyses

Intraclass correlations (ICCs) of EA, sleep, and Coparenting across the first 2 years

According to the unconditional means model, ICCs for maternal EA and coparenting perceptions were 0.46 and 0.76, respectively. Thus, 46% of the variance in bedtime EA and 76% of the variance in coparenting were accounted for by between-person differences. In addition, the ICCs for sleep indicators were 0.75 for sleep onset, 0.38 for sleep fragmentation, 0.27 for WASO, 0.53 for sleep duration, and 0.31 for VSD. The substantial within-person variance of EA, coparenting, and sleep variables (24%–73%) supported the utilization of MLMs and the disaggregation of the between- and within-person effects of maternal coparenting and sleep on bedtime EA.

Levels and change of maternal EA across time

The unconditional growth model (Table S3) suggested that the fixed effect of infant age was non-significant ($b = -0.10$, $p = .22$). Thus, maternal EA was relatively stable on average across the first 2 years postpartum after accounting for all covariates. However, the random effects of the intercept ($\sigma^2_{u0} = 48.58$, 95% CI = [26.11, 90.38]) and infant age ($\sigma^2_{u1} = 0.27$, 95% CI = [0.12, 0.58]) were significant, indicating a significant amount of inter-individual variances in initial levels and changes in maternal bedtime EA. In addition, significant intra-individual variances in bedtime EA were revealed ($\sigma^2_e = 121.73$, 95% CI = [105.99, 139.82]), after controlling infant age and all covariates. Thus, other determinants should be considered to explain these variations in maternal EA at the between- and within-person levels. The current study is particularly interested in the interactive effects of maternal sleep patterns and coparenting relationships on levels and changes in maternal EA across time.

Maternal sleep and coparenting perception as predictors

The conditional models with maternal sleep indicators, coparenting, and their interactions were examined, with a separate model conducted for each sleep indicator (Table 1). In addition, their two- and three-way interactions with infant age were also included to explore whether the main and interactive effects of sleep and coparenting varied across time. Non-significant interactions were removed from the final models reported in Table 1.

Sleep onset × coparenting. As shown in Model 1 of Table 1, the main effect of maternal sleep onset on bedtime EA was not significant at either the between- or within-person level, after controlling for the covariates and coparenting. The main effect of coparenting was significant at the between-person level only, such that higher maternal coparenting perceptions were predictive of higher bedtime EA. In addition, the interactive effect of sleep onset and coparenting on EA was significant at both the between- and within-person level. As shown in Panel A of Figure 1, at the between-person level, earlier sleep onset time was predictive of higher maternal EA at bedtime, and this effect was stronger when maternal coparenting perceptions were higher (+1 *SD*: $b = -2.92$, $SE = 1.19$, $p = .02$) than when coparenting perceptions were lower (−1 *SD*: $b = 0.22$, $SE = 1.09$, $p = .84$). Similarly, at the within-person level (Figure 1, Panel B), when the mother's sleep onset time advanced, relative to her own cross-time average, her bedtime EA also improved. This relation was stronger when the mother experienced increased coparenting quality (+1 *SD*: $b = -3.18$, $SE = 1.30$, $p = .02$), compared with when coparenting perceptions decreased (−1 *SD*: $b = 0.58$, $SE = 1.31$, $p = .66$). No two- or three-

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 1 Fixed effects in conditional models predicting maternal bedtime emotional availability from maternal sleep and coparenting.

	Model 1: Sleep onset			Model 2: Sleep fragmentation			Model 3: WASO			Model 4: Sleep duration			Model 5: VSD		
	b	*SE*	*t*	*b*	*SE*	*t*	*b*	*SE*	*t*	*b*	*SE*	*t*	*b*	*SE*	*t*
Intercept	77.96	1.55	50.45***	77.94	1.55	50.42***	77.61	1.55	50.14***	77.94	1.56	50.00***	78.09	1.53	51.03***
Family INR	1.07	0.46	2.30*	1.33	0.45	2.99**	1.33	0.45	2.97**	1.26	0.46	2.73**	1.34	0.45	3.00**
M-edu	2.30	0.55	4.19***	2.66	0.52	5.15***	2.65	0.51	5.15***	2.54	0.54	4.72***	2.35	0.53	4.41***
Maternal age	0.02	0.19	0.09	−0.06	0.19	−0.33	−0.05	0.19	−0.26	−0.01	0.20	−0.07	−0.06	0.19	−0.29
Infant sex[a]	−3.39	1.60	−2.11*	−3.69	1.58	−2.33*	−3.59	1.58	−2.27*	−3.75	1.62	−2.32*	−3.84	1.59	−2.41*
Shareroom[b]	−1.44	1.68	−0.86	−1.93	1.71	−1.13	−1.96	1.70	−1.15	−1.99	1.67	−1.19	−1.85	1.66	−1.12
Sharebed[b]	−0.88	2.38	−0.37	−0.06	2.44	−0.03	−0.37	2.41	−0.15	−0.65	2.39	−0.27	−0.63	2.37	−0.27
Mixed[b]	1.87	1.93	0.97	1.46	1.97	0.74	1.64	1.95	0.84	1.28	1.93	0.66	1.26	1.93	0.65
Partner status[c]	−4.81	3.76	−1.28	−4.06	3.76	−1.08	−3.65	3.77	−0.97	−4.82	3.76	−1.28	−4.43	3.76	−1.18
Infant age	**−0.02**	**0.08**	**−0.27**	**−0.03**	**0.08**	**−0.33**	**−0.01**	**0.09**	**−0.16**	**−0.02**	**0.08**	**−0.25**	**−0.02**	**0.08**	**−0.23**
Cop (BP)	**3.06**	**1.27**	**2.42***	**2.38**	**1.25**	**1.91**	**2.58**	**1.24**	**2.08***	**2.82**	**1.27**	**2.22***	**2.40**	**1.25**	**1.92**
Cop (WP)	**0.65**	**1.62**	**0.40**	**0.54**	**1.63**	**0.33**	**0.76**	**1.63**	**0.46**	**0.39**	**1.62**	**0.24**	**0.33**	**1.62**	**0.21**
Sleep (BP)	**−1.35**	**0.84**	**−1.60**	**−16.77**	**11.72**	**−1.43**	**−4.33**	**2.50**	**−1.73**	**1.59**	**1.39**	**1.14**	**−8.02**	**3.17**	**−2.53***
Sleep (WP)	**−1.30**	**0.93**	**−1.39**	**−1.95**	**7.16**	**−0.27**	**0.45**	**1.40**	**0.32**	**0.38**	**0.94**	**0.41**	**0.22**	**1.73**	**0.13**
Sleep × Cop (BP)	**−2.36**	**1.17**	**−2.02***	**42.90**	**18.71**	**2.29***	**7.32**	**3.30**	**2.22***	—	—	—	—	—	—
Sleep × Cop (WP)	**−5.66**	**2.75**	**−2.06***	—	—	—	—	—	—	—	—	—	—	—	—

Note: $N_{observations} = 576$. WASO, sleep duration, and VSD reflected in hours. Infant age was centered at 1 month. Within-person variations of coparenting and sleep were calculated by person-mean centering on each mother's cross-time average. Between-person effect was grand-mean centered. Covariates are in italics. Results of main predictors are bolded.

Abbreviations: BP, between-person effects; Cop, maternal coparenting perceptions; M-edu, maternal educational level; VSD, variability in sleep duration; WASO, wake after sleep onset; WP, within-person effects.

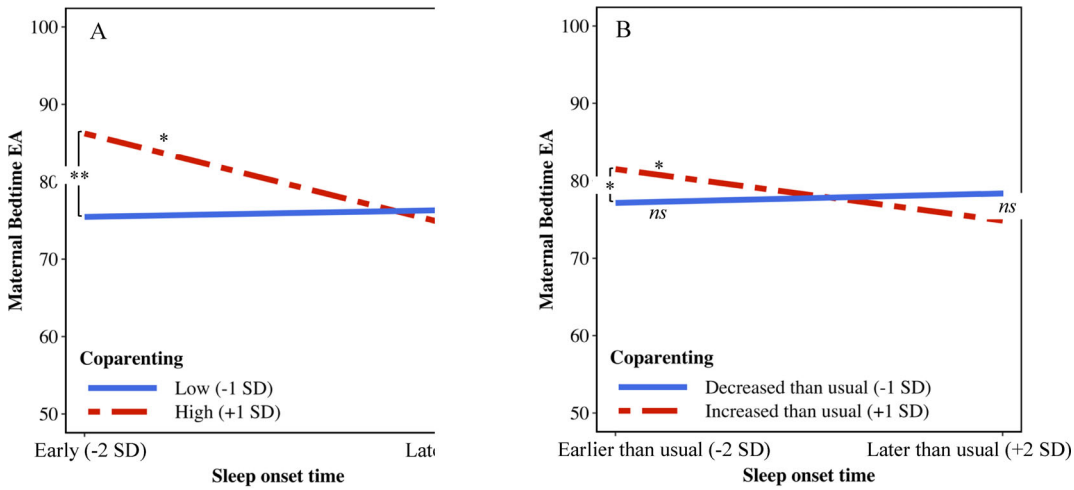
[a]Infant sex was coded "0" for boy and "1" for girl.

[b]Infant sleep arrangements were coded into three dummy variables (i.e., "room sharing," "bed sharing," and "combination") with the "solitary sleep" as the reference category.

[c]Maternal partner status was coded "0" for "having live-in partner," and "1" for "no live-in partner."

*$p < .05$.**$p < .01$.***$p < .001$, two-tailed.

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License



Notes. Within-person variations of coparenting and sleep onset time were calculated by person-mean centering on each mother's cross-time average. The between-person effect was grand-mean centered.
ns = not significant ($p > .05$), *$p < .05$, **$p < .01$, two-tailed.

FIGURE 1 The simple slopes of interactions between sleep onset time and coparenting on maternal bedtime emotional availability (EA) at the between- (panel A) and within-person level (panel B). Within-person variations of coparenting and sleep onset time were calculated by person-mean centering on each mother's cross-time average. The between-person effect was grand-mean centered. *ns*, not significant ($p > .05$); *$p < .05$; **$p < .01$, two-tailed. [Color figure can be viewed at wileyonlinelibrary.com]

way interactions with infant age reached significance, and thus they were removed from the final model.

Sleep fragmentation × coparenting. The model with sleep fragmentation as the predictor (Table 1, Model 2) revealed no significant unique main effect of coparenting perceptions and sleep fragmentation on EA at the between- or within-person level. However, coparenting and sleep fragmentation interacted in predicting maternal bedtime EA at the between-person level. As shown in Figure 2, mothers with higher sleep fragmentation showed lower EA than others, only in those who experienced lower quality of coparenting (−1 *SD*: $b = -45.26$, $SE = 18.65$, $p = .02$). However, linkages between sleep fragmentation and EA were not significant in mothers with higher coparenting perceptions (+1 *SD*: $b = 11.72$, $SE = 15.34$, $p = .45$). No other interactions were evident.

WASO × coparenting. There was no significant main effect of WASO on maternal EA. However, mothers with higher coparenting perceptions displayed higher EA at bedtime than others. This between-person effect was further qualified by its interaction with WASO (Table 1, Model 3). The simple slope tests (Figure 3) showed that higher WASO was related to lower bedtime EA only in mothers reporting lower quality of coparenting (−1 *SD*: $b = -9.20$, $SE = 3.40$, $p = .01$), but not in mothers with higher coparenting perceptions (+1 *SD*: $b = 0.53$, $SE = 3.24$, $p = .87$). The interaction between WASO and coparenting was not significant at the within-person level. Also, the interactive effects with infant age were not significant.

Sleep duration × coparenting. As shown in Model 4 of Table 1, a significant main effect of coparenting was revealed at the between- but not within-person level after controlling for maternal sleep and covariates. Specifically, mothers who reported higher quality of coparenting showed higher bedtime EA. The main effect of maternal sleep duration was non-significant at both the within- and between-person levels. Also, no interactive effect reached significance.

VSD × coparenting. The model with VSD as the predictor (Table 1, Model 5) revealed no unique main effect of coparenting perceptions at the between- or within-person level. However,

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

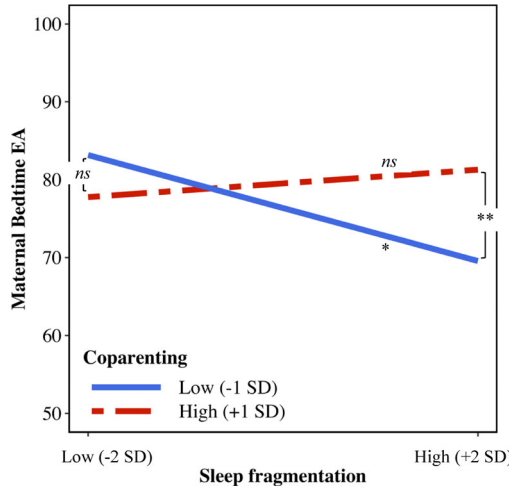


FIGURE 2 Between-Person interaction between maternal sleep fragmentation and coparenting perceptions predicting maternal bedtime emotional availability (EA). The between-person effect was grand-mean centered. *ns*, not significant ($p > .05$); *$p < .05$; **$p < .01$, two-tailed. [Color figure can be viewed at wileyonlinelibrary.com]

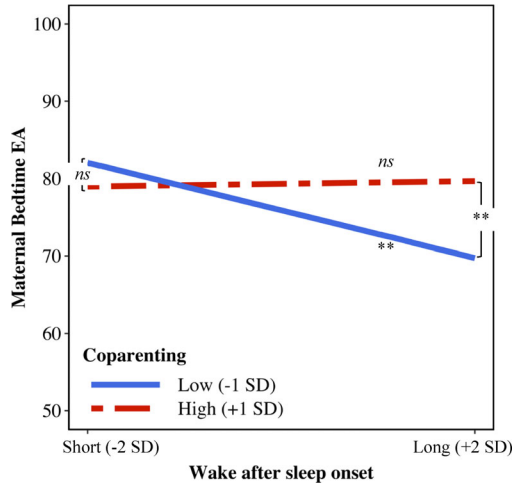


FIGURE 3 Between-Person interaction between maternal wake after sleep onset (WASO) and coparenting perceptions predicting maternal bedtime emotional availability (EA). The between-person effect was grand-mean centered. *ns*, not significant ($p > .05$); *$p < .05$; **$p < .01$, two-tailed. [Color figure can be viewed at wileyonlinelibrary.com]

greater maternal VSD was predictive of lower bedtime EA at the between-person level after controlling for coparenting and covariates. Significant linkages between VSD and EA were not evident at the within-person level. No significant interactive effects were detected from the model, and thus they were removed from the final model.

DISCUSSION

Guided by Feinberg's (2003) ecological model of coparenting and Belsky's (1984) parenting model, the present study investigated the independent and interactive effects of maternal sleep

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

and coparenting perceptions on maternal parenting quality (i.e., observed bedtime EA) across the first 2 years after childbirth. Inspired by family systems theory (Cox & Paley, 2003), which emphasizes the family as a living system open to changes, especially during transitions (e.g., the arrival of a new child), this study examined within-person dynamics in these associations in addition to between-person differences with repeated measurements of all study variables. Moreover, multiple actigraphy-assessed sleep parameters reflecting distinct sleep dimensions (i.e., timing, quality, quantity, variability) were considered in the study to provide a comprehensive understanding of the influences of sleep on parenting. Overall, among the five sleep parameters examined (i.e., sleep onset time, sleep fragmentation, WASO, sleep duration, and VSD), only VSD was independently predictive of maternal EA during infant bedtime interactions (Hypothesis 1), after controlling for maternal coparenting perceptions and multiple sociodemographics, and this association was only revealed at the between-person level. The unique main effect of coparenting quality on bedtime EA (Hypothesis 2) was detected at only the between- but not within-person levels. More importantly, the moderating role of coparenting on linkages between maternal sleep and parenting quality was supported by three of the five sleep parameters, including sleep onset time, sleep fragmentation, and WASO (Hypothesis 3).

Maternal sleep and parenting

The hypothesis that poor maternal sleep health was predictive of poor parenting quality was only supported by the unique main influences of maternal VSD on the levels of bedtime EA at the between-person level, after controlling for coparenting perceptions and all covariates. Specifically, mothers with greater variability in their nighttime sleep duration tended to display poorer quality of parenting during their interactions with their infants at bedtime. With the same study sample, our previous work has revealed similar linkages between sleep variability and parenting quality in the first year postpartum (Bai et al., 2020; Bai et al., 2022). The current study confirmed and extended our previous findings by showing that the between-person linkages between VSD and parenting persisted across the entire first 2 years after childbirth (i.e., with nonsignificant infant age × VSD interaction). This result also aligns with previous research with mothers of older toddlers linking low observed positive parenting during bedtime with high sleep deficit in general (i.e., a sleep composite taking sleep variability into account; McQuillan et al., 2019, 2022). Sleep variability has been identified as an indicator of insomnia (Bredeli et al., 2022), associated with an increased risk for mental health (Slavish et al., 2019) and perceived stress (Veeramachaneni et al., 2019) over and above average sleep. Thus, greater sleep variability may undermine parents' ability to provide sensitive responses during parent–child interactions due to its detrimental effect on individual functioning.

Although prior work has revealed indices of sleep duration (Bai et al., 2020), timing (Bai et al., 2020; Bai et al., 2022), and quality (Bai et al., 2022; King et al., 2020; McQuillan et al., 2019) as significant predictors of parenting quality in infancy and early childhood, no linkage between sleep indices in these dimensions (i.e., sleep duration, fall asleep time, fragmentation, and WASO) and the quality of mothering was revealed in the current study, after controlling for coparenting and several covariates. This discrepancy could be attributed to the distinct sleep variables examined in the studies: previous studies applied subjective sleep indicators (e.g., Bai et al., 2020) or sleep composites calculated from multiple sleep indices (e.g., Bai et al., 2022; King et al., 2020; McQuillan et al., 2019), whereas the current study examined the effect of each objective sleep indicator on parenting and distinguished its between- and within-person effects. In addition, the current study examined the unique effect of sleep after controlling for coparenting and several covariates, which might contribute to the null findings of sleep's main effects. Indeed, several significant concurrent linkages between bedtime EA and multiple sleep indicators (sleep duration, sleep fragmentation, VSD, and sleep onset) were

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

detected in the zero-order correlations, but these effects were eliminated after adjusting for other variables and after separating the within- and between-person associations. Nevertheless, the study revealed significant interactive effects of coparenting and multiple sleep indices on parenting, highlighting the need to understand the conditions under which sleep-parenting linkages may be particularly salient. Further discussion on these interactive effects was presented in later sections.

Maternal coparenting perceptions and parenting

Although previous studies have generally confirmed that coparenting quality would be predictive of parenting quality concurrently and longitudinally (e.g., Altenburger & Schoppe-Sullivan, 2020; Cabrera et al., 2012; Lee et al., 2021), the dynamic within-person covariations between coparenting and parenting were rarely considered. The current study contributes to the literature by predicting changes in parenting quality from the concurrent fluctuations in perceived coparenting quality within one mother (i.e., the within-person associations), in addition to their between-person associations. Consistent with previous research, the current study revealed significant linkages between coparenting and parenting linkages at the between-person level, such that mothers who rated their coparenting relationships more positively displayed better parenting quality than others during infant bedtime interactions. This between-person effect of coparenting on parenting was relatively stable across 1–24 months. Contrary to our hypothesis, coparenting was not uniquely predictive of parenting at the within-person level, after controlling for maternal sleep and covariates. The absence of within-person associations between coparenting and parenting may imply that the joint influences of multiple determinants on parenting should be considered (Belsky, 1984). Indeed, our further analysis showed that within-person fluctuations in coparenting perceptions interacted with maternal sleep onset time in predicting parenting quality.

Interactions between maternal sleep and coparenting

Guided by Feinberg's (2003) ecological model of coparenting and Belsky's (1984) parenting model, the primary aim of the current study is to explore whether coparenting quality moderates the linkage between maternal sleep and parenting. This moderating hypothesis was supported by three of the five sleep parameters examined in the study, with two distinct patterns of interaction emerging—the dual-risk (Sameroff, 1983) and the protective-reactive (Luthar et al., 2000) interactive pattern.

First, findings of sleep quality showed that sleep fragmentation and WASO each interacted with mothers' coparenting perceptions to predict parenting quality. This interaction was detected only at the between-person level. Specifically, in line with the dual-risk model (Sameroff, 1983), mothers with poorer sleep quality (i.e., higher fragmentation, longer WASO) displayed lower bedtime EA, especially for those who also experienced poorer coparenting relationships than others. In contrast, for mothers with higher coparenting perceptions, the association between sleep quality and observed parenting was negligible. Coparenting has been found to serve as a buffer against the detrimental effects of individual risks (e.g., psychological distress, McRae et al., 2021; neuroticism, Zvara et al., 2019) on parenting. The current study extended these findings by providing new evidence that coparenting can also mitigate the detrimental effects of poor quality of maternal sleep on poor parenting.

Second, for sleep timing (i.e., sleep onset time), a different pattern of interaction with coparenting was detected at both the between- and within-person levels. Specifically, at the between-person level, mothers with earlier sleep onset times than others showed higher

17417737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

parenting quality at infant bedtime, especially in those who reported a higher quality of coparenting relationships. However, in mothers with lower coparenting perceptions, no significant association between sleep onset and parenting was revealed. A similar interactive pattern was detected at the within-person level, such that the mother's parenting quality improved when her sleep onset time advanced, and this association was stronger when the mother also reported better coparenting quality than her cross-time average. Overall, these interactions for sleep onset time were consistent with the protective-reactive interactive pattern (Luthar et al., 2000), indicating that a positive coparenting relationship might magnify the beneficial effect of healthy sleep, as indexed by early sleep onset, on parenting quality. A similar moderating effect of coparenting has been reported by previous studies showing that certain family characteristics (e.g., marital satisfaction; Merrifield & Gamble, 2013; easy-to-soothe child; Solmeyer & Feinberg, 2011) only play a role in explaining individual differences in parenting outcomes in parents with high coparenting quality. The current study contributes to the field by demonstrating this moderating effect of coparenting on sleep onset–parenting linkages, not only between different mothers but also within the same mother over time.

In sum, two distinct moderating processes of coparenting perceptions were revealed in linkages between maternal sleep and parenting. The specific process involved may differ depending on the specific sleep dimension being considered: the dual-risk pattern for sleep quality and the protective-reactive pattern for sleep timing. Protective and risk factors can be viewed along a continuum (Rutter, 1993). Supporting the theoretical model of parenting (Belsky, 1984), the two interactive patterns identified are not contradictory but convey a consistent message that healthy sleep might facilitate optimal parenting, especially when coparenting quality is high, whereas sleep problems might undermine parenting capacity, especially when coparenting quality is low.

Limitations

Several limitations of this study need to be pointed out. First, the majority of participants included in the current study were White, highly educated mothers with full-term infants. This relatively homogeneous community sample limits the generalizability of this study's findings to families from more diverse or at-risk populations. Second, parenting was observed only during infant bedtime. Although bedtime interaction is an unstructured, naturalistic context that can offer great ecological validity (Gardner, 2000) and help capture meaningful parenting variations (Teti, in press), it is unknown whether similar within- and between-person associations among maternal sleep, coparenting, and parenting can be revealed with parenting observed in other interaction contexts. Third, this study specifically investigated the effects of coparenting and sleep patterns on parenting in mothers. Thus, whether similar mechanisms would be observed in other caregivers, such as fathers, remained unclear. The low number of fathers captured during bedtime interactions in videos precluded their inclusion in the current examination. It behooves future studies to examine linkages among coparenting relationships, parental sleep, and parenting in fathers as well, and to explore any potential parental gender differences in these associations. Fourth, although one strength of the current study is collecting coparenting information across multiple time points, coparenting quality was rated by mothers and may be subject to reporting bias. Future studies may benefit from incorporating observational measures of coparenting to reduce potential bias presented in self-reported questionnaires in the examination of dynamic linkages among coparenting, sleep, and parenting. Nonetheless, it is acknowledged that repeated direct observations of coparenting can be time-consuming and costly.

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

CONCLUSION AND IMPLICATIONS

Despite these limitations, this study is the first to examine complex interactions between sleep and coparenting on parenting quality across the entire first 2 years after childbirth, utilizing repeated assessments of all study variables to enable the disaggregation of between- and within-person linkages, incorporating naturalistic observations of parenting during infant bedtime and objective measurements of mothers' sleep health, and considering sleep indices from multiple sleep dimensions. The findings in this study provide evidence that maternal sleep as a determinant of parenting quality depended on the coparenting relationships mothers experienced. Consistent with Belsky's (1984) parenting model, parenting may benefit the most when both the maternal sleep–wake system and coparenting system provide support and might be most compromised when both systems produce stress.

Our study could have several implications. First, although the current study demonstrated the effects of maternal sleep on parenting, the underlying mechanisms that may explain this linkage remain unclear. Although no theory has explicitly addressed links between parental sleep and parenting, we proposed that parental emotional and cognitive functions, which are likely to be detrimentally affected by disrupted and inadequate sleep (Gobin et al., 2015; Veeramachaneni et al., 2019), may serve as potential mediators. More empirical examinations, especially those with longitudinal designs, are needed to further confirm these hypothesized pathways. At the same time, our findings indicated that parental sleep could be a malleable target of parenting interventions, and sleep patterns can be an easily assessed marker for identifying mothers at risk for poor parenting. Second, the complicated, dynamic interplays between coparenting and sleep in predicting parenting, on one hand, indicate that mothers, especially those with poor sleep health, could benefit from supportive coparenting relationships during the postpartum period (Kuersten-Hogan & McHale, 2021). Indeed, previous interventions targeting coparenting relationships in the transition to parenthood have proven effective in preventing negative parenting (Feinberg et al., 2022; Jones et al., 2018). On the other hand, these results inform parenting interventions that mothers are likely to gain more from promotion programs addressing both parental sleep health and the coparenting relationship as key areas for improvement.

ACKNOWLEDGMENTS

This paper was supported by a grant from the National Institute of Health and Human Development, R01 HD052809, awarded to the third author. We thank Molly Countermine, Corey Whitesell, Cori Reed, and Renee Stewart for their assistance in coordinating this project. Special thanks are given to the participating families.

DATA AVAILABILITY STATEMENT

Access to the data and code for this study can be requested by emailing the corresponding author.

ORCID

Liu Bai https://orcid.org/0000-0001-7018-0594
Brian Crosby https://orcid.org/0000-0002-0646-6907
Douglas M. Teti https://orcid.org/0000-0002-1574-6257

REFERENCES

Acebo, C., Sadeh, A., Seifer, R., Tzischinsky, O., Wolfson, A. R., Hafer, A., & Carskadon, M. A. (1999). Estimating sleep patterns with activity monitoring in children and adolescents: How many nights are necessary for reliable measures? *Sleep*, *22*(1), 95–103. https://doi.org/10.1093/sleep/22.1.95

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Ainsworth, M. D. S., Blehar, M. C., Waters, E., & Wall, S. N. (1978). *Patterns of attachment: A psychological study of the strange situation*. Erlbaum.

Altenburger, L. E., & Schoppe-Sullivan, S. J. (2020). New fathers' parenting quality: Personal, contextual, and child precursors. *Journal of Family Psychology*, *34*(7), 857–866. https://doi.org/10.1037/fam0000753

Bai, L., Kim, C. Y., Crosby, B., & Teti, D. M. (2022). Maternal nighttime sleep and infant–mother attachment security: The mediating role of maternal parenting quality during bedtime and free play. *Developmental Psychology*, *58*(5), 923–934. https://doi.org/10.1037/dev0001327

Bai, L., Whitesell, C. J., & Teti, D. M. (2020). Maternal sleep patterns and parenting quality during infants' first 6 months. *Journal of Family Psychology*, *34*(3), 291–300. https://doi.org/10.1037/fam0000608

Belsky, J. (1984). The determinants of parenting: A process model. *Child Development*, *55*(1), 83–96. https://doi.org/10.1111/j.1467-8624.1984.tb00275.x

Biringen, Z. (2000). Emotional availability: Conceptualization and research findings. *American Journal of Orthopsychiatry*, *70*(1), 104–114. https://doi.org/10.1037/h0087711

Biringen, Z., Robinson, J. L., & Emde, R. N. (1998). *Emotional availability scales* (3rd ed.). Psychology Press.

Blandon, A. Y. (2015). Mothers' and fathers' responses to children's negative emotions: Family and physiological correlates. *Family Relations*, *64*(3), 431–445. https://doi.org/10.1111/fare.12125

Booth, A. T., Macdonald, J. A., & Youssef, G. J. (2018). Contextual stress and maternal sensitivity: A meta-analytic review of stress associations with the maternal behavior Q-Sort in observational studies. *Developmental Review*, *48*, 145–177. https://doi.org/10.1016/j.dr.2018.02.002

Bredeli, E., Vestergaard, C. L., Sivertsen, B., Kallestad, H., Øverland, S., Ritterband, L. M., Glozier, N., Pallesen, S., Scott, J., & Langsrud, K. (2022). Intraindividual variability in sleep among people with insomnia and its relationship with sleep, health and lifestyle factors: An exploratory study. *Sleep Medicine*, *89*, 132–140. https://doi.org/10.1016/j.sleep.2021.12.006

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. In R. M. Lerner & W. Damon (Eds.), *Handbook of child psychology: Vol. 1. Theoretical models of human development* (6th ed., pp. 793–828). Wiley.

Buysse, D. J. (2014). Sleep health: Can we define it? Does it matter? *Sleep*, *37*(1), 9–17. https://doi.org/10.5665/sleep.3298

Cabrera, N. J., Scott, M., Fagan, J., Steward-Streng, N., & Chien, N. (2012). Coparenting and children's school readiness: A mediational model. *Family Process*, *51*(3), 307–324. https://doi.org/10.1111/j.1545-5300.2012.01408.x

Çetin, M., & Demircan, H. Ö. (2022). Coparenting and parental involvement in education: The mediating role of motivational beliefs. *Journal of Family Studies*, *29*(3), 1–27. https://doi.org/10.1080/13229400.2022.2045210

Chary, M., McQuillan, M. E., Bates, J. E., & Deater-Deckard, K. (2020). Maternal executive function and sleep interact in the prediction of negative parenting. *Behavioral Sleep Medicine*, *18*(2), 203–216. https://doi.org/10.1080/15402002.2018.1549042

Cohen, P., Cohen, J., Aiken, L. S., & West, S. G. (1999). The problem of units and the circumstance for POMP. *Multivariate Behavioral Research*, *34*(3), 315–346. https://doi.org/10.1207/S15327906MBR3403_2

Cox, M. J., & Paley, B. (2003). Understanding families as systems. *Current Directions in Psychological Science*, *12*(5), 193–196. https://doi.org/10.1111/1467-8721.01259

Fagan, J., & Palkovitz, R. (2019). Coparenting and father engagement among low-income parents: Actor–partner interdependence model. *Journal of Family Psychology*, *33*(8), 894–904. https://doi.org/10.1037/fam0000563

Feinberg, M. E. (2003). The internal structure and ecological context of coparenting: A framework for research and intervention. *Parenting: Science and Practice*, *3*(2), 95–131. https://doi.org/10.1207/S15327922PAR0302_01

Feinberg, M. E., Brown, L. D., & Kan, M. L. (2012). A multi-domain self-report measure of coparenting. *Parenting: Science and Practice*, *12*(1), 1–21. https://doi.org/10.1080/15295192.2012.638870

Feinberg, M. E., Gedaly, L., Mogle, J., Hostetler, M. L., Cifelli, J. A., Tornello, S. L., Lee, J. K., & Jones, D. E. (2022). Building long-term family resilience through universal prevention: 10-year parent and child outcomes during the COVID-19 pandemic. *Family Process*, *61*(1), 76–90. https://doi.org/10.1111/famp.12730

Gardner, F. (2000). Methodological issues in the direct observation of parent–child interaction: Do observational findings reflect the natural behavior of participants? *Clinical Child and Family Psychology Review*, *3*(3), 185–198. https://doi.org/10.1023/a:1009503409699

Gay, C. L., Lee, K. A., & Lee, S.-Y. (2004). Sleep patterns and fatigue in new mothers and fathers. *Biological Research for Nursing*, *5*(4), 311–318. https://doi.org/10.1177/1099800403262142

Girschik, J., Fritschi, L., Heyworth, J., & Waters, F. (2012). Validation of self-reported sleep against actigraphy. *Journal of Epidemiology*, *22*(5), 462–468. https://doi.org/10.2188/jea.je20120012

Gobin, C. M., Banks, J. B., Fins, A. I., & Tartar, J. L. (2015). Poor sleep quality is associated with a negative cognitive bias and decreased sustained attention. *Journal of Sleep Research*, *24*(5), 535–542. https://doi.org/10.1111/jsr.12302

Goldberg, W. A., & Keller, M. A. (2007). Parent–infant co-sleeping: Why the interest and concern? *Infant and Child Development*, *16*(4), 331–339. https://doi.org/10.1002/icd.523

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Hagen, E. W., Mirer, A. G., Palta, M., & Peppard, P. E. (2013). The sleep-time cost of parenting: Sleep duration and sleepiness among employed parents in the Wisconsin Sleep Cohort Study. *American Journal of Epidemiology*, *177*(5), 394–401. https://doi.org/10.1093/aje/kws246

Hoffman, L., & Stawski, R. S. (2009). Persons as contexts: Evaluating between-person and within-person effects in longitudinal analysis. *Research in Human Development*, *6*(2–3), 97–120. https://doi.org/10.1080/15427600902911189

Insana, S. P., Garfield, C. F., & Montgomery-Downs, H. E. (2014). A mixed-method examination of maternal and paternal nocturnal caregiving. *Journal of Pediatric Health Care*, *28*(4), 313–321. https://doi.org/10.1016/j.pedhc.2013.07.016

Jones, D., Feinberg, M., Hostetler, M., Roettger, M., Paul, I. M., & Ehrenthal, D. B. (2018). Family and child outcomes 2 years after a transition to parenthood intervention. *Family Relations*, *67*(2), 270–286. https://doi.org/10.1111/fare.12309

Kang, M. J., Matsumoto, K., Shinkoda, H., Mishima, M., & Seo, Y. J. (2002). Longitudinal study for sleep–wake behaviours of mothers from pre-partum to post-partum using actigraph and sleep logs. *Psychiatry and Clinical Neurosciences*, *56*(3), 251–252. https://doi.org/10.1046/j.1440-1819.2002.00992.x

Kim, B.-R., & Teti, D. M. (2014). Maternal emotional availability during infant bedtime: An ecological framework. *Journal of Family Psychology*, *28*(1), 1–11. https://doi.org/10.1037/a0035157

Kim, C. Y., Fredman, S. J., & Teti, D. M. (2021). Quality of coparenting and infant–mother attachment: The mediating role of maternal emotional availability. *Journal of Family Psychology*, *35*(7), 961–971. https://doi.org/10.1037/fam0000846

King, L. S., Rangel, E., Simpson, N., Tikotzky, L., & Manber, R. (2020). Mothers' postpartum sleep disturbance is associated with the ability to sustain sensitivity toward infants. *Sleep Medicine*, *65*, 74–83. https://doi.org/10.1016/j.sleep.2019.07.017

Kuersten-Hogan, R., & McHale, J. P. (2021). The transition to parenthood: A theoretical and empirical overview. In R. Kuersten-Hogan & J. P. McHale (Eds.), *Prenatal family dynamics* (pp. 3–21). Springer. https://doi.org/10.1007/978-3-030-51988-9_1

Lee, J. Y., Volling, B. L., & Lee, S. J. (2021). Material hardship in families with low income: Positive effects of coparenting on fathers' and mothers' parenting and children's prosocial behaviors. *Frontiers in Psychology*, *12*, 729654. https://doi.org/10.3389/fpsyg.2021.729654

Lee, J. Y., Volling, B. L., Lee, S. J., & Altschul, I. (2020). Longitudinal relations between coparenting and father engagement in low-income residential and nonresidential father families. *Journal of Family Psychology*, *34*(2), 226–236. https://doi.org/10.1037/fam0000612

Leonhard, C., & Randler, C. (2009). In sync with the family: Children and partners influence the sleep-wake circadian rhythm and social habits of women. *Chronobiology International*, *26*(3), 510–525. https://doi.org/10.1080/07420520902821101

Luthar, S. S., Cicchetti, D., & Becker, B. (2000). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development*, *71*(3), 543–562. https://doi.org/10.1111/1467-8624.00164

Matthews, K. A., Patel, S. R., Pantesco, E. J., Buysse, D. J., Kamarck, T. W., Lee, L., & Hall, M. H. (2018). Similarities and differences in estimates of sleep duration by polysomnography, actigraphy, diary, and self-reported habitual sleep in a community sample. *Sleep Health*, *4*(1), 96–103. https://doi.org/10.1016/j.sleh.2017.10.011

McHale, J. P. (1995). Coparenting and triadic interactions during infancy: The roles of marital distress and child gender. *Developmental Psychology*, *31*(6), 985–996. https://doi.org/10.1037/0012-1649.31.6.985

McQuillan, M. E., Bates, J. E., Staples, A. D., & Deater-Deckard, K. (2019). Maternal stress, sleep, and parenting. *Journal of Family Psychology*, *33*(3), 349–359. https://doi.org/10.1037/fam0000516

McQuillan, M. E., Bates, J. E., Staples, A. D., & Deater-Deckard, K. (2022). A 1-year longitudinal study of the stress, sleep, and parenting of mothers of toddlers. *Sleep Health*, *8*(1), 47–53. https://doi.org/10.1016/j.sleh.2021.08.006

McRae, C. S., Overall, N. C., Henderson, A. M., Low, R. S., & Chang, V. T. (2021). Parents' distress and poor parenting during a COVID-19 lockdown: The buffering effects of partner support and cooperative coparenting. *Developmental Psychology*, *57*(10), 1623–1632. https://doi.org/10.1037/dev0001207

Meltzer, L. J., Montgomery-Downs, H. E., Insana, S. P., & Walsh, C. M. (2012). Use of actigraphy for assessment in pediatric sleep research. *Sleep Medicine Reviews*, *16*(5), 463–475. https://doi.org/10.1016/j.smrv.2011.10.002

Merrifield, K. A., & Gamble, W. C. (2013). Associations among marital qualities, supportive and undermining coparenting, and parenting self-efficacy: Testing spillover and stress-buffering processes. *Journal of Family Issues*, *34*(4), 510–533. https://doi.org/10.1177/0192513x12445561

Moehler, E., Biringen, Z., & Poustka, L. (2007). Emotional availability in a sample of mothers with a history of abuse. *American Journal of Orthopsychiatry*, *77*(4), 624–628. https://doi.org/10.1037/0002-9432.77.4.624

Palmer, C. A., & Alfano, C. A. (2017). Sleep and emotion regulation: An organizing, integrative review. *Sleep Medicine Reviews*, *31*, 6–16. https://doi.org/10.1016/j.smrv.2015.12.006

Parkes, A., Green, M., & Mitchell, K. (2019). Coparenting and parenting pathways from the couple relationship to children's behavior problems. *Journal of Family Psychology*, *33*(2), 215–225. https://doi.org/10.1037/fam0000492

Pinheiro, J., Bates, D., DebRoy, S., Sarkar, D., & R Core Team. (2021). nlme: Linear and Nonlinear Mixed Effects Models. https://CRAN.R-project.org/package=nlme

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Riemann, D., Berger, M., & Voderholzer, U. (2001). Sleep and depression—Results from psychobiological studies: An overview. *Biological Psychology*, *57*(1–3), 67–103. https://doi.org/10.1016/s0301-0511(01)00090-4

Rutter, M. (1993). Resilience: Some conceptual considerations. *Journal of Adolescent Hhealth*, *14*(8), 626–631. https://doi.org/10.1016/1054-139X(93)90196-V

Sadeh, A. (2011). The role and validity of actigraphy in sleep medicine: An update. *Sleep Medicine Reviews*, *15*(4), 259–267. https://doi.org/10.1016/j.smrv.2010.10.001

Sadeh, A., Sharkey, M., & Carskadon, M. A. (1994). Activity-based sleep-wake identification: An empirical test of methodological issues. *Sleep*, *17*(3), 201–207. https://doi.org/10.1093/sleep/17.3.201

Sameroff, A. (1983). Developmental systems: Contexts and evolution. In W. Kessen (Ed.), *Handbook of child psychology: Formerly Carmichael's manual of child psychology* (Vol. 1, pp. 237–294). Wiley.

Sayer, L. C. (2016). Trends in women's and men's time use, 1965–2012: Back to the future? In S. M. McHale, V. King, J. Van Hook, & A. Booth (Eds.), *Gender and couple relationships* (pp. 43–77). Springer International Publishing. https://doi.org/10.1007/978-3-319-21635-5_2

Slavish, D. C., Taylor, D. J., & Lichstein, K. L. (2019). Intraindividual variability in sleep and comorbid medical and mental health conditions. *Sleep*, *42*(6), zsz052. https://doi.org/10.1093/sleep/zsz052

Solmeyer, A. R., & Feinberg, M. E. (2011). Mother and father adjustment during early parenthood: The roles of infant temperament and coparenting relationship quality. *Infant Behavior and Development*, *34*(4), 504–514. https://doi.org/10.1016/j.infbeh.2011.07.006

Teti, D. M. (in press). Assessing parenting in context: Naturalistic assessment, domain specificity, and early development. In D. M. Teti, H. H. Cleveland, & K. Rulison (Eds.), *Handbook of research methods in developmental science* (2nd ed.). Wiley.

Teti, D. M., Kim, B. R., Mayer, G., & Countermine, M. (2010). Maternal emotional availability at bedtime predicts infant sleep quality. *Journal of Family Psychology*, *24*(3), 307–315. https://doi.org/10.1037/a0019306

Teti, D. M., Shimizu, M., Crosby, B., & Kim, B.-R. (2016). Sleep arrangements, parent–infant sleep during the first year, and family functioning. *Developmental Psychology*, *52*(8), 1169–1181. https://doi.org/10.1037/dev0000148

U.S. Census Bureau. (2014a). Educational attainment. American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1501. https://data.census.gov/table/ACSST5Y2014.S1501?t=Education&g=040XX00US42&y=2014

U.S. Census Bureau. (2014b). Median income in the past 12 months (in 2014 inflation-adjusted dollars). American Community Survey, ACS 5-Year Estimates Subject Tables, Table S1903. https://data.census.gov/table/ACSST5Y2014.S1903?t=Income(Households,Families,Individuals)&g=040XX00US42&y=2014

U.S. Census Bureau. (2014c). RACE. American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B02001. https://data.census.gov/table/ACSDT5Y2014.B02001?q=RACE&g=040XX00US42&y=2014

Ullman, J. B. (2007). Structural equation modeling. In B. G. Tabachnick & L. S. Fidell (Eds.), *Using multivariate statistics* (5th ed., pp. 676–780). Pearson Education.

Varma, P., Conduit, R., Junge, M., & Jackson, M. L. (2020). Examining sleep and mood in parents of children with sleep disturbances. *Nature and Science of Sleep*, *12*, 865–874. https://doi.org/10.2147/NSS.S271140

Veeramachaneni, K., Slavish, D. C., Dietch, J. R., Kelly, K., & Taylor, D. J. (2019). Intraindividual variability in sleep and perceived stress in young adults. *Sleep Health*, *5*(6), 572–579. https://doi.org/10.1016/j.sleh.2019.07.009

Wang, J., Schoppe-Sullivan, S. J., Yan, J., & Yoon, S. (2022). Examining parents' susceptibility: Coparenting relationships and parental involvement in low-income families. *Journal of Marriage and Family*, *85*(2), 458–476. https://doi.org/10.1111/jomf.12901

Zvara, B. J., Altenburger, L. E., Lang, S. N., & Schoppe-Sullivan, S. J. (2019). The role of coparenting in the association between parental neuroticism and harsh intrusive parenting. *Journal of Family Psychology*, *33*(8), 945–953. https://doi.org/10.1037/fam0000555

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Bai, L., Crosby, B., & Teti, D. M. (2025). Maternal sleep, coparenting quality, and parenting across the first 2 years postpartum. *Journal of Marriage and Family*, *87*(4), 1502–1523. https://doi.org/10.1111/jomf.13094

17413737, 2025, 4, Downloaded from https://onlinelibrary.wiley.com/doi/10.1111/jomf.13094 by Cambodia Hinari NPL, Wiley Online Library on [24/10/2025]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License