



## CLINICAL REVIEW

## Parenting and infant sleep

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## S U M M A R Y

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Infant sleep undergoes dramatic evolution during the first year of life. This process is driven by underlying biological forces but is highly dependent on environmental cues including parental influences. In this review the links between infant sleep and parental behaviors, cognitions, emotions and relationships as well as psychopathology are examined within the context of a transactional model. Parental behaviors, particularly those related to bedtime interactions and soothing routines, are closely related to infant sleep. Increased parental involvement is associated with more fragmented sleep. Intervention based on modifying parental behaviors and cognitions have direct effect on infant sleep. It appears that parental personality, psychopathology and related cognitions and emotions contribute to parental sleep-related behaviors and ultimately influence infant sleep. However, the links are bidirectional and dynamic so that poor infant sleep may influence parental behaviors and poor infant sleep appears to be a family stressor and a risk factor for maternal depression.

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## Introduction

The term parenting refers to a complex set of parents' behaviors, duties, roles, expectations, cognitions and emotions related to caring, raising and educating their child. The evolution of sleep–wake patterns from multiple sleep episodes distributed around the 24-h period to one main consolidated sleep episode at night is a complex developmental process substantially engaging and challenging the parents during the first years.<sup>1,2</sup> Difficulties in this developmental process are associated with complaints about difficulty falling asleep and multiple and prolonged night wakings that often cause family distress and are among the most common complaints to pediatricians and other child-care professionals.<sup>3–5</sup>

In this review paper we examine the complex and bidirectional relationships between parenting and infant sleep in the context of a transactional model described in Fig. 1.<sup>6</sup>

The transactional model emphasizes the ongoing bidirectional links between parenting and infant sleep. Parents' beliefs, expectations, emotions and behaviors related to infant sleep are influenced by: a) their socio-cultural and environmental context; b) their own developmental history and memories; c) their personality and psychopathology; d) the infant's age and developmental characteristics; and e) the infant's own sleep patterns. Infant sleep

is influenced by: a) maturational, intrinsic constitutional, biological, temperamental and medical factors and b) by parental influences and factors mediated mainly by parental interactive behaviors.

This review does not cover the constitutional, temperamental, biological and medical factors that play a significant role in shaping infant sleep. It is based on a thorough literature search (period: 1990–April, 2009) using the terms sleep, infant or infancy, parent, mother, and/or father. All identified papers were searched for relevant references or citations. Because of space limitations, newer publications received higher priority to represent the current state of knowledge.

In the following sections, we explore the scientific support for each of the model's components with regard to parenting and infant sleep. The sections are structured in a way that starts from direct influences related to parenting behaviors (with emphasis on bedtime interactions) and infant sleep, continues through layers related to cognitions, emotions, relationships and psychopathology, as well as more distal and indirect influences such as socio-cultural factors. The final section includes clinical implications regarding the involvement of parents in interventions for infant sleep problems.

*Parental behavior and infant sleep*

According to the transactional model, the link between parental behaviors and infant sleep is the most immediate and direct path. The most persistent finding in the literature on

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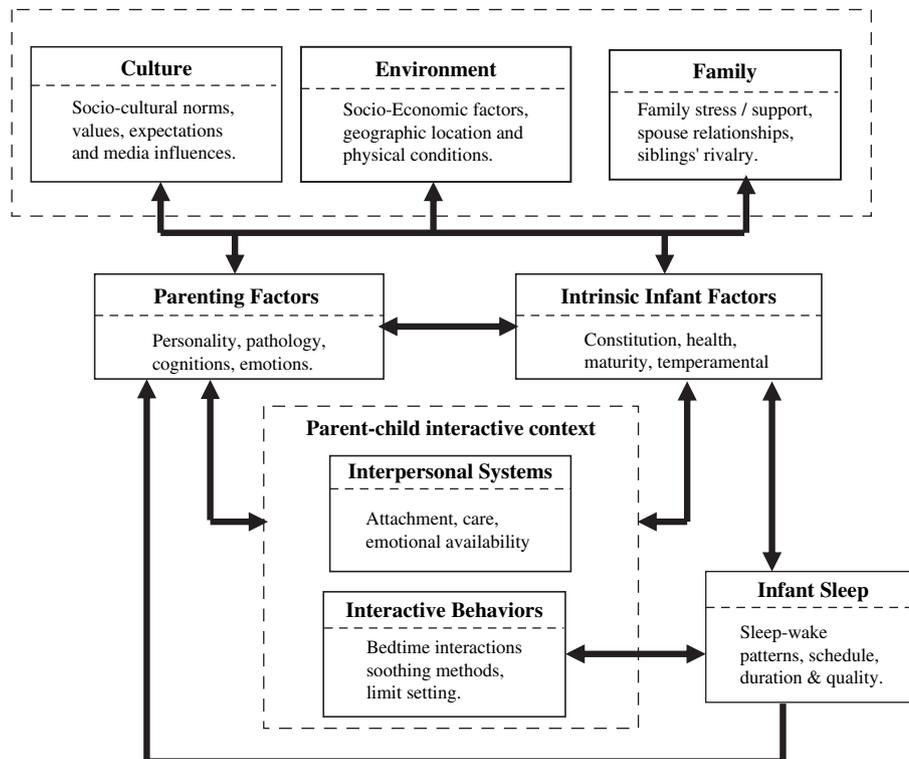


Fig. 1. Infant sleep and parenting in a transactional model. Adapted from Sadeh and Anders.<sup>6</sup>

parenting and infant sleep is related to the link between parental nocturnal involvement and infant sleep problems. In comparison to infants who fall asleep in their crib with minimal parental assistance, infants who fall asleep with significant parental involvement (i.e., while being held, fed, rocked, etc.) are more likely to have an increased number and duration of night wakings.<sup>2,7–12</sup> It is assumed that infants who fall asleep with high level of parental involvement and soothing fail to develop their own self-regulation and soothing skills and, therefore, continue to rely on repeated parental interventions during the night. For instance, Adair et al.<sup>13</sup> found that 9-month-old infants whose parents were present at bedtime, woke up at night significantly more than infants whose parents were not present. Similar findings were found in another study, in which parent–infant nighttime interactions were studied through the use of time-lapse video.<sup>14</sup> Morrell and Cortina-Borja<sup>8</sup> studied strategies parents use to settle their infants to sleep. They found that excessive active physical comforting combined with reduced encouragement of infant’s autonomy was associated with infant sleeping problems. Moreover, the authors examined patterns of change in parental behavior over a year follow-up period and found that delayed encouragement of infant self-soothing was associated with a greater probability of persistent infant sleeping problems. One other study assessed factors associated with fragmented sleep at 5, 17, and 29 months in a cross-sectional design. Parental presence until sleep onset was the factor most strongly associated with not sleeping at least 6 consecutive hours per night at 17 months and 29 months of age.<sup>11</sup> A recent study<sup>9</sup> based on a large US–Canada Internet sample found that parental interventions and sleep ecology (e.g., location of sleep) explained a significant part of the variability in children’s sleep patterns. Parental interventions encouraging independence and self-soothing were associated with extended and more consolidated sleep in comparison to more active soothing, which was associated with shorter and more

fragmented sleep. These results are similar to an earlier internet based study conducted on an Israeli population.<sup>15</sup> However, the causal direction of these links cannot be determined from these and many other correlational studies.

One of the most basic maternal interventions during infancy is breastfeeding. There are well-established advantages of breastfeeding for the development of infants which makes breastfeeding a highly recommended maternal practice. However, breastfeeding has been found to be associated with more frequent night wakings and with lower percentage of self-soothing.<sup>2,7</sup> During the first months of life, infants who nurse may wake up more frequently than bottle-fed infants because breast milk is digested faster, leading to a shorter interval between feedings. Later on, when feeding is not physiologically necessary anymore to satiate hunger, breast-fed infants may need breastfeeding after awakening mainly as a soothing method helping them to fall back to sleep.<sup>7,11</sup>

In conclusion, minimal parental involvement during the settling process and throughout the night is associated with more consolidated sleep in infants. Clinicians tend to interpret these correlations as evidence that parental behaviors determine infant sleep, however, the alternative interpretation, that infants with more difficult sleep patterns require more parental involvement, is also a very viable interpretation. There is evidence to support links in both directions, in accord with the transactional model.<sup>6,10</sup>

#### *The role of parental cognitions in infant sleep*

According to the transactional model, parental cognitions regarding infant sleep drive parental sleep-related behaviors that directly influence infant sleep. As described above, the literature linking parental behaviors (particularly increased bedtime involvement) and infant sleep problems is quite extensive,

however, only a few studies have attempted to explore the underlying factors leading certain parents to become highly involved at night, and others, to limit their involvement and encourage self-soothing. One line of research pertinent to this issue focuses on the role of parental cognitions (e.g., perceptions, attitudes, expectations, and interpretations) about infant sleep and their relation to parenting behavior at night and to infant sleep.

The role of parental cognitions in child development has received increasing attention during the last two decades. Different studies have shown that parental cognitions about child behavior are significantly linked to child development. It is assumed that this link is mediated through the way parents behave and interact with their children.<sup>16,17</sup> Although studies investigating the role of parental cognitions in infant sleep are still limited, there is evidence suggesting that there are significant links between parental sleep-related cognitions and infant sleep patterns and sleep problems.<sup>18–22</sup> For example, Morrell<sup>19</sup> studied the links between maternal cognitions and infant sleep and found that reported infant sleep problems were significantly associated with maternal cognitions related to: a) difficulty with limit setting (e.g., “I should respond straightaway when my child wakes crying at night”; b) increased doubts about parenting competence (e.g., “When my child doesn’t sleep at night I doubt my competence as a parent”); c) increased anger at the infant’s demands (e.g., “When my child cries at night and needs me I wish he/she wasn’t so demanding”). A follow-up study, conducted one year later, examined the relative role of different etiological factors to infant sleeping problems. Maternal cognitions reflecting difficulties in limit setting and anger at the child’s demands seemed to be the most important factors in explaining the variance in sleep problems. Moreover, these variables together with difficult infant temperament explained the degree to which parents used active physical soothing to settle their infants to sleep, and these soothing methods predicted the continuation of sleeping problems.<sup>18</sup>

Two recent studies assessed the links between parental cognitions and infant sleep using both objective (actigraphy – based on wristwatch-like activity monitors used to objectively assess sleep–wake measures) and subjective methods to assess sleep. The first study examined the links between infant sleep and parental sleep-related cognitions in a group of sleep-disturbed infants and controls.<sup>20</sup> Both fathers and mothers were asked to complete Morrell’s<sup>19</sup> questionnaire and the Infant Sleep Vignettes Interpretation Scale (ISVIS).<sup>20</sup> The latter questionnaire includes 14 hypothetical vignettes of infants who display behavioral sleep problems and after each description parents are asked to rate their agreement with 3 different assertions reflecting possible interpretations of the sleep problem. The findings of this study demonstrated that parents of sleep-disturbed infants reported more cognitions reflecting difficulties related to limit setting than control parents.<sup>20</sup> Significant differences were also found between fathers and mothers on the cognitions scale. It was found that fathers were more likely than mothers to emphasize the importance of a limit-setting approach. Moreover, the findings revealed that paternal cognitions reflecting difficulties in limit setting were linked to more infant night wakings, in addition and independently of maternal cognitions. These results imply that when both parents experience difficulty in limit setting, there is a greater risk for infant sleep problems. The second study<sup>10</sup> used a longitudinal design (from pregnancy through the first year) to assess the predictive and concomitant links between maternal cognitions (measured by the above mentioned ISVIS questionnaire) and the development of infant sleep. The findings demonstrated that maternal cognitions, emphasizing the possibility that infants feel distressed upon awakening at night and, therefore, need direct

parental help, predicted and were associated with more frequent infant night wakings at the age of 6 and 12 months. On the other hand, maternal cognitions emphasizing the importance of limiting parental nighttime involvement predicted more consolidated sleep. In addition, it was found that parental soothing techniques mediated the link between maternal cognition and infant sleep. For example, mothers who emphasized the interpretation that infants experience distress upon awakening were more likely to be involved in active bedtime soothing, and increased use of active soothing was related to more infant night wakings.<sup>10</sup>

Taken together, these studies suggest that parental cognitions pertaining to infant sleep and particularly those related to concerns about limiting parental nighttime involvement, are related to fragmented sleep pattern and disrupted sleep. More research is necessary to clarify the causal relations between parental sleep-related cognitions, their actual soothing behaviors, and the sleep of the infant.

#### *Attachment and separation: the links between relationship aspects and infant sleep*

According to the transactional model, complex relationship systems shape parental perceptions, interpretations, emotions and interactions with the child and are likely to shape the infant’s sleep and the parents’ sense of competence and well-being.

Attachment theory highlights the enduring bonding of infants to their primary caregivers and emphasizes that these ties, driven by underlying biological and psychological processes, is crucial for physical and emotional survival.<sup>23,24</sup> The threat of separation or loss of the attachment figure is a major stressor throughout the life cycle but it is particularly critical during infancy and early childhood. Attachment perspective also addresses the strong emotional ties of parents to their infant and the motivational caregiving system to protect the infant, which is the complementary process to the infant’s search for protection.<sup>23–25</sup>

#### *Infant attachment and sleep*

Going to sleep is a real challenge for many infants. Settling for the night in a dark room, and in many cases, in a separate crib or even a separate room, represents separation from the ongoing interactions with the attachment figure and is a potentially stressful situation. Therefore, the links between attachment and sleep have been a topic of interest.<sup>26–30</sup> One of the underlying hypotheses has been that infants who experience insecurity, specifically, ambivalence in their attachment relationships are more likely to experience sleep problems in comparison to secure infants. However, research on attachment and sleep in infants provided so far only very limited support for this hypothesis.

One established way to assess attachment in infants is the Strange Situation Procedure.<sup>31</sup> In this procedure the behavior of infants is observed during trial separations and reunions with their attachment figure and they are classified according to their behaviors as securely attached or as insecure with different sub-categories. In a study assessing sleep and attachment (based on the Strange Situation Procedure) in 100 low-risk 12-month-olds the percentage of infants who were defined by their mothers as *night-wakers* was consistently high in both the secure (55%) and ambivalent (60%) infants.<sup>29</sup> The severity of the sleep-related difficulties was similar in these two groups, with settling difficulties especially prevalent among the secure-dependent sub-classification. In a subgroup of non-selected infants, actigraphic assessment of sleep revealed no links between sleep quality and the child’s security.<sup>29</sup> In a subsequent study with 57 low-risk 12-month-old infants, in

which the Attachment Q-Set procedure was used to assess attachment style, the degree of security in the attachment relationship was not associated with the frequency of reported night waking or with the degree of settling difficulties.<sup>30</sup> In the subsample of 44 infants security of attachment was not associated with the objective sleep measures.<sup>30</sup>

Morrell and Steele<sup>18</sup> compared attachment in 14- to 16-month-old infants with sleep problem and controls. The infants and their mothers participated in the Strange Situation Procedure and the mothers provided a 2-week sleep diary. There were more insecure-ambivalent infants in the group of infants with sleep problems as compared to the good sleepers. The frequency and duration of night wakings was greater in the ambivalent group as compared to the other classifications. Importantly, a follow-up assessment, at age 2 years, indicated that sleep problems were more likely to persist in the ambivalent group. However, the majority of infants with persistent sleeping problems were securely attached to their mothers.<sup>18</sup> This finding highlights that while ambivalent attachment may be a risk indicator for continued sleeping problems, other factors, such as active physical comforting<sup>8</sup> – a construct associated with child temperament and maternal cognition rather than with security of attachment – is a better predictor for the persistence of sleep problems.<sup>18</sup>

As indicated earlier, separation from the primary caregiver is potentially a threat to the infant's sense of security. Daytime clinginess and more physical contact with the mother characterize night-wakers as compared to good sleepers.<sup>29,32</sup> Similarly, infants who were ranked high on dependency on the mother had more sleep problems compared to infants who were less clingy and dependent.<sup>30</sup> Paret<sup>32</sup> explained that if mothers continuously provide bodily presence for the reduction of tension and anxiety, infants learn to depend on them for regulating emotions and experience heightened distress when separation occurs, both during the day and at night. Field<sup>33</sup> citing both animal studies and human research maintains that separations are stressful experiences for the young infant because of the loss of the major source of stimulation and arousal modulation. In one of these studies the effects of short mother–child separation on the child's biobehavioral functioning was examined.<sup>34</sup> The findings indicated that while their mother was hospitalized for giving birth the children's responses were characterized by increased crying, negative affect, higher activity level and increased night wakings.

#### *Maternal attachment and infant sleep*

Benoit et al.<sup>35</sup> assessed attachment in mothers whose toddlers were treated for sleep disturbance in comparison to mothers of children with no such sleep problems. Applying the Adult Attachment Interview, an interview procedure designed to characterize adult internal model of attachment by measuring childhood memories and recollections of early relationships with attachment figures, it was revealed that *all* the mothers in the clinical group were classified as insecurely attached compared to 57% in the control group. This result suggests that secure maternal attachment may serve a protective role in the development of sleep disorders. Still, as one in two children without sleep disorders also had an insecure mother,<sup>35</sup> other factors that mediate or moderate the association between maternal attachment and the child's sleep need to be further explored.

In a longitudinal study during the first year, no links were found between maternal attachment style and the child's sleep habits, which were recorded with videography.<sup>2</sup> To conclude, while there is a theoretical grounding for linking parents' insecure attachment to their children's sleep problems, empirical evidence, so far, is scarce and inconclusive.

#### *Maternal separation anxiety*

Separations are likely to be perceived as anxiety-provoking situations not only by the child but also by the mother. Just as separation from the mother activates the child's attachment system,<sup>23</sup> a complementary parental "caregiving system" is activated upon separation from the infant.<sup>25</sup> Because separation from the offspring threatens immediate protection and provision of care, the lack of proximity during the night is expected to provoke anxiety in the caregiver.<sup>23,25</sup>

Maternal separation anxiety (MSA) has been studied by Hock and colleagues<sup>36</sup> who defined it as an unpleasant emotional state that involves feelings of guilt, worry, and sadness that accompany short-term separations from the child. Higher levels of separation anxiety were found to be associated with over sensitivity to the infant's distress signals,<sup>37</sup> physical proximity at bedtime,<sup>38</sup> and more involvement during the course of the night.<sup>39</sup> Importantly, it has been shown that higher levels of anxiety were associated with more fragmented sleep measured objectively and that this association was independent of temperament.<sup>38</sup> Together these findings lend support to the contention that separation anxiety regulates nighttime involvement with the infant, and, in turn, may interfere with the development of self-soothing.

#### *Emotional availability and positive feelings*

Parent–child relationships comprise not only of sensitivity to distress signals but also emotional availability and responsiveness to a wide range of infants' emotional states and needs that serve to regulate emotional and physiological processes, including sleep–wake organization. Surprisingly, only a few studies addressed the role of emotional availability and quality of parent–child relationships in relation to infants' sleep. For example, comparison between sleep-disturbed infants and toddlers and their matched controls indicated that the mothers of referred group rated their children as less likeable and agreeable.<sup>40</sup> In another study, mothers in the disturbed group were less reciprocal during feeding, but they showed similar levels of responsiveness during play.<sup>41</sup> In community samples, positive dyadic interaction during play was associated with more and longer episodes of objective night wakings,<sup>29</sup> as well as with consistency in sleeping arrangement.<sup>42</sup> Together these findings suggest that difficulties around sleep are not marked by an overall negative emotionality in mother–infant relationship. Furthermore, in normative samples, sleep-related difficulties and night wakings are typically occurring within positive mother–infant relationship. Higher availability and responsiveness to meet the child's actual, and perceived needs, and the overall joy parents experience in the caring role are likely to shape their tolerance for night wakings as well as to contribute to the maintenance of high parental involvement in sleep regulation that often contributes to sleep difficulties. Clearly, there is more than one path that determines how involved parents are in regulating their child's sleep–wake states; in this section we pointed out that one such path could be driven by positive parent–child dynamics.

#### *Parental personality, psychopathology and well-being*

Parental personality and psychopathology play a major role in the way parents process information and develop perceptions, expectations, emotions and interactions with their infants. Furthermore, according to the transactional model, sleep problems in infancy can be experienced as a major stressor, challenging the well-being of parents. However, the research on the links between infant sleep and parental personality and psychopathology has been limited. Most studies in this area are related to maternal depression.

Mood disorders in pregnancy and during the postpartum periods have been linked to altered sleep physiology in the mothers, as well as to sleep loss and fatigue.<sup>43</sup> Field et al.<sup>44</sup> found that depressed pregnant women reported more sleep disturbances compared to non-depressed group and subsequently their newborns exhibited high levels of fussiness and disrupted sleep including less time in deep sleep. Similarly, data from a large cohort in the UK revealed that prenatal maternal anxiety and depression predicted more sleep problems in toddlers aged 18–30 months.<sup>45</sup> As this link was maintained after controlling for postnatal mood, it was concluded that anxious and depressed mothers-to-be are at increased risk for having children with sleep problems. With respect to postpartum depression, depressed mothers reported more infants' sleep difficulties in the first few weeks,<sup>46</sup> and later in the first year.<sup>47</sup> In contrast, data from the National Institute for Child Health and Human Development Study of Early Child-Care showed that depressive symptoms at 6 months postpartum were only weakly correlated with infants' night waking. However, the rate of clinically significant depression scores was about double in mothers of infants with persistent and severe night waking in comparison with mothers whose infants slept through the night.<sup>48</sup>

Beyond the infancy period, in a clinical sample of mothers with mood disorders,<sup>49</sup> sleep problems were more frequent, severe and persistent in toddlers and children of affectively ill mothers. However, in non-selected toddlers, in both the UK<sup>18</sup> and the US<sup>50</sup> that were followed-up from the 1st to the 2nd year, maternal depression scores had a negligible effect on the prediction of sleep problems, over and beyond the contribution of child variables, and parenting cognitions and practices.<sup>18,50</sup>

In sum, while there are some inconsistencies, most studies establish a link between maternal depression and sleep difficulty in infants and young children. The inconsistencies in the findings could be attributed to a number of factors including sampling differences (low-risk vs. clinical groups), timing of measurement of maternal depression (e.g., prenatal, postpartum, or subsequently during infancy/toddlerhood), and the child's age. Age is a critical factor not only in terms of the timing of the parents' depression but also with respect to the developmental tasks faced by children at different ages.<sup>51</sup> In considering the mechanisms of transmission, heritability, dysfunctional neuroregulatory mechanisms, exposure to negative maternal behavior and affect, and a stressful context have all been proposed for explaining the elevated risk for behavioral difficulties among children of depressed mothers.<sup>51</sup>

Whereas multiple mechanisms may explain why maternal psychopathology might impact sleep-wake regulation in the infant, a complementary pathway by which infant's poor sleep is a risk factor for maternal well-being and mental health has also been explored. In a series of large-scale community-based infant sleep studies in Australia<sup>3,5,52</sup> the mental health of mothers was examined in relation to infant sleep. In one study<sup>3</sup> mothers who reported that their 3- to 6-month-old infant had sleep problems also reported poorer mental and physical health. However, when maternal sleep quality was controlled, the associations between mental health and infants' sleep quality diminished. In another survey<sup>52</sup> sleep problems during the second part of the first year were correlated with higher maternal depression scores. Interestingly, mothers who did not consider their infant as a poor sleeper, despite the reported sleep-related difficulties, were less likely to report depression; it is possible that maternal perception of good sleep quality attenuates the association between sleep problems and maternal depression. Following-up infants from 2 to 24 months, Wake et al.<sup>5</sup> found that persistent sleep problems had a small, but statistically significant, effect on the prediction of maternal depression.

The sleep-related data of the National Institute of Child Health and Human Development study were further examined with respect to toddlers. Contrary to the expectations, longer duration of awakenings predicted decreased maternal depressive symptoms, but only for the 15–24 months age period. At the same time, maternal depressive symptoms were found to moderately predict an increased frequency of child awakenings.<sup>53</sup> In this research, as in many other investigations, both the sleep and the mental health variables were based on maternal reports, confounding the associations. Intervention studies that aimed to resolve behavioral sleep problems, documented improvements in both infants' sleep and parental mood and well-being.<sup>54–57</sup> Separating the “chicken and the egg” question<sup>58</sup> may be impossible to resolve. Still, in line with our transactional model, there is substantial support for bidirectional pathways associating infant sleep with parental physical and mental health.

#### *Cultural and social influences on parental nighttime practices*

The transactional model suggests that the socio-cultural setting plays an important role in shaping parental expectations and parenting style. Most of the findings reviewed in this paper are based on studies that were conducted in western countries. Moreover, many of the studies examined families in which solitary infant sleep is the common practice. Nevertheless, parenting practices and expectations regarding infant sleep and whether certain sleep behaviors (e.g., night wakings) are perceived as problematic vary vastly according to cultural norms, ethnicity and socioeconomic background.<sup>59–62</sup>

A good example for the diversity in sleep-related practices relates to the issue of co-sleeping (for a comprehensive review of co-sleeping see Thoman<sup>63</sup>). Co-sleeping was and still is the most common sleeping arrangement in the majority of cultures around the world. Although co-sleeping is not the norm in the industrialized West, it has become more common in many western countries during the last decade (e.g., in the United States and Britain).<sup>64</sup> Both physical and psychosocial risks and benefits have been ascribed to co-sleeping. *Proponents* of co-sleeping argue that: a) co-sleeping is the most natural sleeping arrangement and it responds best to the infant's basic psycho-physiological needs; b) co-sleeping facilitates breastfeeding; c) co-sleeping may facilitate the infant's socio-emotional development by providing the infant close and intimate contact with the caregiver; and d) co-sleeping may protect against SIDS.<sup>65</sup> On the other hand, *opponents* of co-sleeping argue that co-sleeping should be avoided because of various physical and developmental concerns. Specifically, opponents claim that a) most research indicates that co-sleeping places an infant at greater risk for death or accidents and that this safety consideration is more important than all other possible benefits of co-sleeping; b) co-sleeping may hinder the development of infant independence and autonomy and lead to sleeping patterns that would be hard to change; and c) co-sleeping is related to more sleep problems, especially night waking and bedtime struggles.<sup>64,66,67</sup>

Studies examining the different motives parents have for co-sleeping in the US have distinguished between two sub-types of co-sleepers: parents who are in favor of solitary sleeping arrangements but use co-sleeping in reaction to sleep problems (reactive co-sleeping) and parents who voluntarily choose co-sleeping as their preferred arrangement (intentional co-sleepers). Recent studies demonstrate that the perceptions parents may have regarding their child's sleep behavior and whether it would be considered problematic or not vary considerably according to this distinction. In comparison to reactive co-sleeping, parents who choose to co-sleep are more likely to consider their infants' night behaviors (e.g., night wakings) as natural and are less likely to be troubled by them.<sup>62,68,69</sup>

Although research on the effects of co-sleeping on infant sleep yielded conflicting results, laboratory studies using polysomnographic assessment revealed that when infants co-sleep with their mothers they are more likely to have more spontaneous arousals during deep sleep stages and spend less time in these stages.<sup>70,71</sup>

#### *Parenting and clinical interventions for infant sleep problems*

Difficulty falling asleep and night wakings are the most common sleep problems during infancy, estimated in approximately 20–30% of the infants.<sup>72–74</sup> The associations between infant sleep patterns and parental cognitions and bedtime behaviors described earlier suggest that parents play an important role in the evolution and maintenance of sleep problems during infancy.<sup>75</sup> Furthermore, the clinical definitions of these problems include diagnostic terms such as “Sleep Onset Association Disorder” and “Limit Setting Sleep Disorder” which implicate parenting or caregiving behaviors in the definition of the disorder.<sup>76</sup> Therefore, it is not surprising that most clinical interventions and clinical research focused on working with the parents in modifying their cognitions and behaviors related to infant sleep.<sup>4,77</sup>

Research on night wakings in sleep-disturbed infants suggests that although they tend to wake up more than controls (as measured objectively by video recordings or actigraphy) their main problem is their inability to soothe themselves back to sleep or to resume sleep with minimal parental help.<sup>20,78,79</sup> Control infants are more likely to resume sleep independently without parental awareness of their night wakings. As reviewed above, parental sleep-related behaviors are influenced by the parents’ expectations, cognitions and emotions. Therefore, a central ingredient in behavioral interventions for infant sleep problems is modifying not only parents’ behavior but also parental cognitions and expectations.<sup>4,77,80</sup> The basic assumption underlying most behavioral intervention for infant sleep problems is that *excessive* parental involvement and interaction with the infant during the process of falling asleep and in response to night wakings is rewarding to the child and interferes with self-regulation and soothing skills. Therefore, most behavioral interventions are focused on reducing and withdrawing parental involvement and “encouraging” the infant to develop self-soothing skills.<sup>4,77,80</sup>

It is beyond the scope of this review to describe the established behavioral interventions in detail. Briefly, the common intervention methods include approaches such as unmodified extinction (“cry it out”), graduated extinction that includes scheduled checking visits (e.g., every 5 min) by the parents to reassure the baby of their presence and to provide minimal help (e.g., pacifier, resuming sleeping position), and graduated extinction with parental presence.

It is important to emphasize that most interventions involve some level of infant protest and crying because of the relative withdrawal of the parents and the elimination of the infant’s preferred routines (rocking, nursing, falling asleep while being held, etc.). This issue of crying and protest is a real challenge to many parents because of the difficulty in coping with the emotions and anxiety arising from the infant’s distress signs and with fears from possible psychological damage to the infant.

Studies assessing behavioral interventions for infant sleep difficulties have repeatedly demonstrated the efficacy of these methods in improving sleep.<sup>4,77,80</sup> In a study assessing the process of intervention using both objective and subjective sleep measures it was shown that during the intervention process infants learn to resume sleep faster and often without parental assistance and that the number of objective night wakings also decreases.<sup>79</sup> Furthermore, it has been demonstrated that these interventions lead to broader improvement in child behavior and parental well-being.<sup>40,41,54,56,57,81–83</sup> Concerns have been raised that behavioral

intervention involving infant protest and crying may compromise infant–parent attachment relationships. However, to date, there are no published studies demonstrating such adverse effects, and, as indicated above, sleep intervention studies, that have measured proxies of attachment, found no evidence of derived infant problem behavior or parenting difficulty which are linked to insecure infant attachment.<sup>40,41,54,56,57,81–83</sup>

Interventions aimed at early prevention of sleep problems in infancy have also shown some promise.<sup>84–86</sup> These interventions were based on educating parents about sleep promoting principles and have led to better sleep or lower rates of infants with sleep problems in the intervention groups in comparison to controls.

## Conclusions

The relationships between parenting and infant sleep are complex and multidimensional. As suggested by the transactional model, associations exist between infant sleep and different levels of parenting that include parental behaviors, cognitions and emotions, parent–child relationships and attachment, parental well-being and psychopathology, and the socio-cultural context of the parents. Furthermore, research has demonstrated that the links between parenting and infant sleep are bidirectional and that in addition to the well-established evidence that parenting plays a major role in shaping infant sleep there is accumulating evidence that infant sleep and sleep problems can influence parental mood and well-being, as well as modify parental behaviors and reactions.

### Research agenda

1. Research on parenting and sleep should include screening for known sleep-related medical problems and physiological effects on sleep.
2. What are the positive and negative short- or long-term consequences of behavioral interventions based on withdrawal of parental involvement during the night (and the common infant protest and crying reactions) in domains such as: child’s and parents’ daily functioning, child attachment and sense of security, and child–parent relationships?
3. Most of the research in the field of infant sleep and parenting focused mainly on the assessment of mothers. The role of the father in general infant care and in specific sleep-related activities and interactions and the influence of paternal characteristics and involvement on infant sleep is a relatively unexplored topic.
4. What are the crucial parental factors and child characteristics that need to be considered in sleep interventions? How should interventions be tailored considering these factors?
5. The majority of studies on infant sleep and parenting used a naturalistic correlational design. More well-controlled and longitudinal studies are needed to better understand the causal relations or the direction of prediction between parental factors and infant sleep.
6. Research on parenting and infant sleep should include objective measures (e.g., video recordings or actigraphy) to minimize findings that may represent primarily subjective biases and response set.
7. Most of the research has been conducted on western cultures and on parents representing the middle-upper socioeconomic status. The links described between infant sleep and parenting should be further explored in more diverse populations.

### Practice points

1. Infant sleep problems are a major concern in early development and a source for family distress that can severely disrupt the well-being of the parents.
2. In treating infant sleep problems potential medical and biological sources for the problem should be addressed first.
3. The assessment of infant sleep problems should include a comprehensive evaluation of all the parental factors that may contribute or maintain the sleep problems (e.g., parental soothing behaviors, cognitions, attachment relationship, and psychopathology).
4. Discrepancies and inconsistencies between sleep-related cognitions, emotions, and behavioral practices and experiences of parents contribute to parental confusion and concerns regarding infant sleep.
5. As parents play a major role in shaping infant sleep educating them on realistic perceptions and expectations, and on sleep promoting practices is the major strategy in resolving infant sleep problems.
6. Developmentally appropriate sleep interventions should focus on educating parents about the ongoing needs of infants as well as on age related changes.
7. Socio-cultural factors have significant influence on parental perceptions and ideologies including sleep-related practices. Culturally-sensitive interventions should be tailored to promote infant sleep within the specific context and consider individual child and family characteristics.

### Conflict of interests

The authors have no conflict of interests to report.

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