ENCYCLOPEDIA
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Development

Factors Associated with Sleep Problems in Early Childhood

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Introduction

Child sleep problems have gained the attention of the scientific community in the 70s. Large epidemiological studies carried out in Australia, the United States, Italy, Brazil and Israel have found that about 30% of preschool children suffer from sleep problems.[1-5] No wonder sleep problems in children are one of the most frequent reasons for clinical paediatric consultations today.[6] Persistent sleep problems can affect several aspects of child development (physical, cognitive, social),[7,8] and can have negative consequences on the early parent-child relationship.[9] On the contrary, these functions also influence sleep. So it is better to create a virtuous cycle of sleep than a vicious one! It is therefore imperative to identify the factors likely to foster or to hinder good sleep so that childhood sleep problems can be treated.

Subject

The International Classification of Sleep Disorders[10] has grouped 84 different types of sleep problems into four categories: 1) dyssomnias, 2) parasomnias, 3) sleep disorders associated with

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psychiatric disorders, and 4) sleep disorders associated with medical disorders. Although knowledge about sleep problems was first acquired with adults, more and more researchers are now trying to better understand the two main types of sleep problems among children: dyssomnias and parasomnias. The “dyssomnia” diagnosis of the DSM-IV[11] is rarely attributed to young children. Gaylor and colleagues[12] established a more appropriate nosology for young children by recording two types of precursors to insomnia (protodysomnias):

1. Night wakings (>2 wakings/night [1–2 years] and >1 waking/night [2 years or older]); and
2. Sleep onset problems (>30 minutes to fall asleep [1–2 years] and >20 minutes to fall asleep [2 years or older]) according to three degrees of severity:
    a. normal disturbance (1 episode per week),
    b. perturbation (2–4 episodes per week), and
    c. disorder (5–7 episodes per week), for at least one month.

It goes without saying that night waking or sleep onset problems are associated with a poor consolidation as well as a shorter duration of night-time sleep. Sleep problems are influenced by both biological factors[13-15] and environmental factors.[16,17]

Recent Research Results

According to the model of human sleep regulation, sleep is regulated by two physiological processes. Process S, or the homeostatic process representing the propensity to sleep, increases during waking and decreases exponentially during sleep. The circadian process (Process C) is independent of sleep-wake periods and controls the propensity to waking, and follows a cycle of roughly 24 hours.[18] It is the interaction of the two processes that enables adults to have about 8 hours of consolidated sleep and to remain awake for periods of 16 consecutive hours. The conceptual model of sleep-wake regulation in children is still being developed.[18,19] Sleep problems in the first few months could be the result of a poor orchestration of the emergence of these two regulation processes. For example, a slower maturation of S and/or C could lead to the presence of nocturnal waking or sleep onset problems in infants. However, it is normal to observe variability in the age at which a sleep-wake rhythm is consolidated,[20] which suggests that factors other than maturation of the two processes play a role in sleep consolidation. Children learn how to sleep, just as in any other developmental sphere. Sadeh and Anders[16] propose a theoretical model of child sleep, with a perspective including several systems or environmental contexts.

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Intrinsic context (factors associated with the child). Certain child-specific characteristics influence the establishment of consolidated sleep. Two longitudinal studies covering the period of birth to 2 years[21,22] as well as other studies[23-25] have shown an association between poor sleep consolidation and difficulties in the perinatal period such as a long delivery, a low birth score (e.g. muscle tone, reflex), a birthweight less than 2500 grams, a prematurity index (e.g. < 37 weeks), or a low APGAR score (e.g., asphyxia), while other studies have not found such a relationship.[26-29] Difficult temperament has been reported as associated with sleep problems.[25,30-32] The sex of the child, however, appears to have little effect on the development of a consolidated sleep-wake pattern.[6,25,33-35] Separation anxiety could also be a significant factor to examine since children with a higher level of separation anxiety have more night wakings.[36]

Extrinsic context (factors associated with the parent). Parent characteristics also influence the establishment of consolidated sleep insofar as they are associated with certain bedtime habits or practices. Anxious, over-protective or depressive mothers, or mothers who experienced insecurity in their attachment history, are more likely to have children with sleep problems compared to other mothers.[37-40] For example, studies have shown that depression in mothers affects children's sleep consolidation.[4,25,27,29,41,42] This relationship may be attributable to a modification of maternal behaviours (overprotection) hindering the child's learning of independent sleep habits.[37] Maternal age and education, however, show little effect on sleep consolidation in children aged 0 to 4 years.[23,27,40] Mothers who work outside the home reported that their children's sleep is more fragmented than that of children whose mothers are at home.[43,44] However, family structure seems to have little effect on the development of a consolidated sleep-wake rhythm in young children.[21,25,44]

Interactive context (factors associated with the parent-child relationship). Sleep is deeply rooted in a social context where parents seem to play a crucial role.[41,45] An epidemiological study carried out among premature and full-term infants suggested that the immaturity of the nervous system could be a less important factor in the development of sleep problems than inadequate parental behaviours.[29] Studies have shown that inadequate parenting behaviours at bedtime such as lack of parental presence while the child falls asleep are the best predictors of sleeping problems in young children (1- and 2-year-olds).[4,40,43] Anders & Eiben[46] go so far as to state that parent-child interactions at bedtime may predict the emergence of protodyssomnias in young children.

In Western culture, sleeping alone is considered a keystone in the concept of “a good sleeper.”[41] In fact, the majority of paediatric professionals recommend that children sleep by themselves.[47] Sleeping in the parental bed (co-sleeping) is associated with a greater prevalence of sleep problems, especially among children over 4 years of age.[6] The majority of children with sleep problems (70%) have slept in the parental bed following a night waking compared to 23% of children without sleep problems.[48] It has been recognized that ethnicity and socio-economic status influence the practice of co-sleeping. Unlike Western cultures, the association between bed sharing and sleep problems is not reported in non-Western cultures,[50] nor in low-income, non-Caucasian communities.[27] This absence of association may be explained by the fact that, in these cases, bed sharing is not a reaction to a night waking but rather, a repeated nightly habit. When it is in reaction to a child’s night waking, co-sleeping is clearly associated with sleep problems.[40,51,52]

Some studies have shown a positive correlation between breastfeeding and signalled night wakings,[28,33,44,53] while other studies have not found such a relationship.[21,22,27,45,54] It is important not to think, however, that night breastfeeding hinders sleep consolidation, when the virtues of breastfeeding are numerous for the mother and the infant, and for the establishment of the attachment relationship between them. An overly hasty response to demand is more likely the cause of this association rather than the means of feeding per say.[55,56] Finally, children who have a transitional object (e.g. blanket, stuffed animal or pacifier) and who use it to comfort themselves or self-soothe when trying to fall asleep without their mother’s presence are less likely to signal their wakings.[37,41]

Treatment recommendations

In the majority of cases of sleep problems in early childhood, behavioural methods involving the parents should be explored before resorting to medication (see review of behavioural treatments[57]). It is important to investigate the child’s physical condition (e.g., colic, epileptic seizures) to make sure the sleep problem is not of medical origin. Given that a reduced amount of sleep does not foster optimal child development, it is important to break the vicious cycle of sleep problems as soon as they appear, or even to prevent them before they appear. Investigating parental behaviours surrounding the sleep period is of utmost importance in a clinical evaluation of a child with sleep problems. For example, if a child falls asleep in his parent’s arms before being placed in his bed for the night, one recommendation to parents could be to place the child awake in his bed so that he learns to fall asleep on his own at bedtime and can transfer this learning to falling back asleep after a night waking. As well, it is important to emphasize the introduction of a transitional

object (e.g., stuffed animal or blanket), and a warm, comforting, calming routine that fosters the child's autonomy during the sleep onset phase. In this way, the child will develop reference points in time and space that will reduce his separation anxiety and facilitate his ability to fall back asleep on his own during the night.[25] The effectiveness of behavioural strategies in establishing sleep consolidation at night is not empirically demonstrated in children less than 6 months old.[58] It is recommended to analyze the interconnectivity between the associated factors mentioned above and to aim for realistic targets based on the child's age so that they can learn to sleep through the night. Finally, it is recommended that the proposed treatment should foster the development of a secure attachment relationship between the parents and the child.

Key Research Questions

For all these factors hindering the development of consolidated sleep in young children, it is important to keep in mind that it can be difficult to distinguish cause from effect: for example, if a child is not sleeping 6 consecutive hours at 6 months, the parent may be more likely to get the child out of bed to soothe him after a night waking. Controlled studies are therefore needed to understand the specific elements that foster a child's learning to self-soothe and the establishment of good sleep in early childhood. We also do not know if the behavioural methods reported above would have higher rates of success during critical developmental periods. We all know that each child has his or her own temperament. Future research studies could focus on evaluating the physiological sensitivity thresholds of "poor sleepers" compared to "good sleepers" in order to provide assistance adapted to children with difficult temperaments. We also have more and more immigrants from various countries. Unfortunately, there are too few studies on the sleep of immigrants and their children to be able to offer viable avenues for intervention. Rona and his colleagues[59] showed that recent immigration increases the risk of sleep problems in young children. Another promising research avenue would be to study early childhood sleep problems with twins in a laboratory setting in order to find out the relative contribution of genetics and the environment.

Conclusions

The study of normal and pathological child sleep is of utmost importance for understanding child development. It has been shown that a higher proportion of children with chronically short or poor sleep prior to age 3-and-a-half demonstrate higher levels of hyperactivity, poorer performance on standardized cognitive tests and a higher risk of obesity at age 6 as compared to children who

have slept about 10-11 hours per night in early childhood.[7,8] One of the messages to retain is that we should not wait too long to seek help, as the more a child's sleep problems persist, the greater the risk that they become chronic.

Implications for Policy and Services

Sleep problems in young children are one of the main motives for consultation in paediatrics. Early childhood health professionals should be knowledgeable about the ontogeny of sleep so that they are able to distinguish between "normal" sleep disturbances, symptomatic of the normal sleep maturation process, and "real" early childhood sleep problems. In addition, they should be able to closely explore interactions between the baby and the parents so as to determine whether the problem comes from a physiological disorder or from a behavioural disorder. Parents of children who have been weaned from night feedings should have access to services that provide behavioural treatment methods offered by sleep specialists. During prenatal classes and in the newborn guide received at the hospital, parents should be made aware of the behaviours to establish in order to foster good sleep habits in their newborn, because sleep problems that become chronic in young children can have significant repercussions on their development and on family life. Finally, given the strong prevalence of sleep problems in early childhood, the transfer of knowledge by sleep specialists should be extended to people in all fields, from daycares to government authorities.

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