



Development of the Sleep-Wake System and its Relationship to Children's Psychosocial Development

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Topic

Sleeping behaviour

Introduction

The maturation of the sleep-wake system and the consolidation of nocturnal sleep is a very prominent and rapid process in early childhood.^{1,2} This process is influenced by the child's psychosocial context^{1,3-14} and has a significant impact on the child's neurobehavioural and emotional functioning.¹⁵⁻¹⁸ Furthermore, the child's sleep patterns or sleep disruptions have significant effects on the well-being of the parents.^{5,7,19}

Subject

Sleep is affected by the child's psychosocial setting and has a significant impact on child development. The bi-directional relationships between sleep and psychosocial facets of the developing child constitute an important topic for child-care professionals. It is crucial for professionals to identify factors that could facilitate children's sleep, and to be sensitive to the impact poor or insufficient sleep can have on child development.

Problems

Sleep-wake patterns evolve rapidly during early development and are considered to be one of the major developmental or health concerns during this period. Surveys indicate that 20 to 30 percent of children are considered to be poor sleepers during the first three years of life.^{3,14,20-24} High rates of poor sleep have also been documented in preschool and kindergarten children.^{11,25} The high prevalence of sleep problems and their potential adverse effects on psychosocial development are the main research and clinical issues in early childhood.

Research Context

A variety of research methods have been employed to study the relationship between sleep and psychosocial environment and development. Sleep in infants and young children has been studied using methods such as polysomnography,^{26,27} time-lapse video,^{1,28} actigraphy,^{25,29,30} direct observations^{31,32} and parental reports.^{3,15,20} Most studies have been cross-sectional. Longitudinal studies in this field are extremely rare. Furthermore, most studies were correlative in nature and therefore preclude causal interpretations. Some experimental studies on the effects of sleep manipulation have been performed in older (school-age) children.

Key Research Questions

The extensive research in this field can be divided into three main research questions: (a) How do psychosocial factors affect the evolving sleep-wake patterns of the child? (b) What is the impact of poor or insufficient sleep on the child's psychosocial development? and (c) Which are the most effective psychosocial interventions for improving children's sleep?

Recent Research Results

A. Psychosocial effects on children's sleep

Parental characteristics such as personality, psychopathology, employment and education have been repeatedly associated with sleep in early childhood.^{7-9,13,33-35} Parent-child bedtime interactions have been consistently shown to be linked to children's sleep. It has been demonstrated that parental presence and active involvement in soothing the child to sleep are associated with an increase in reported sleep problems.^{1,3,36,37} Furthermore, most behavioural intervention methods for early childhood sleep problems are based on withdrawal of excessive parental involvement in the child's process of falling asleep or resuming sleep following a night-waking.³⁸⁻⁴² Another psychosocial factor that has received wide attention vis-à-vis sleep in young children is the issue of co-sleeping. Co-sleeping can represent a culturally or socially acceptable choice or a parental response to the child's sleep difficulties. In most studies, co-sleeping was associated with more frequent night-wakings and complaints about sleep,⁴³⁻⁴⁶ although the association between co-sleeping and sleep problems appears to be dependent on socio-cultural factors. A fierce debate exists regarding the advantages and disadvantages of co-sleeping.⁴⁷⁻⁵¹ Among the more serious disadvantages of co-sleeping is the risk for very young babies to be suffocated or injured in the parental bed.

Sleep is also associated with stress and trauma in early childhood.⁵² For instance, short-term separation from the mother could result in sleep disruptions.^{53,54} However, contrary to common belief, not all stressors lead to disrupted sleep and there are studies that suggest that sometimes escape to sleep is the preferred mode of bio-behavioural regulation of stress.⁵²

B. The impact of poor or insufficient sleep

Years of research in animals and humans (mostly with adults or older children) have demonstrated that poor or insufficient sleep leads to compromised alertness, cognitive deficits and compromised physiological functioning. The research on this topic in young children is very limited and mostly of a correlative nature. Thus, poor sleep has been associated with difficult temperament.⁵⁵⁻⁵⁹ However, other studies have failed to find such relationships.^{60,61} A recent study of preschool children found that disrupted sleep patterns predicted less optimal adjustment in preschool.¹⁵ Studies of school-age children have demonstrated links between poor or restricted sleep and compromised neurobehavioural functioning.⁶²⁻⁶⁴ Furthermore, there is a growing body of evidence suggesting that sleep-related physiological phenomena (e.g., snoring and periodic leg movement syndrome), which are prevalent in children, are associated with compromised daytime functioning.⁶⁵⁻⁶⁹

The long-term effects of poor or insufficient sleep are not known. It has been suggested that sleep deprivation in early childhood during critical periods of brain maturation may lead to chronic adverse effects on psychosocial development. However, only limited data from longitudinal studies lend some support to this hypothesis.^{11,18,70-73} For instance, severe sleep problems in infancy increased the likelihood of a diagnosis of ADHD at 5.5 years of age.⁷³

C. Effective interventions for sleep problems in early childhood

Extensive research demonstrates the efficacy of behavioural approaches and parents' education in preventing and treating sleep problems in early childhood. Behavioural treatments have yielded very high success rates.^{30,39,40,42,74} Prevention programs focused on educating expectant parents or parents of very young infants have shown a decrease in the occurrence of sleep problems.⁷⁵⁻⁷⁷ Furthermore, a survey has shown that many parents utilize information available in the media to solve their children's sleep problems with high success rates.⁷⁸

It is important to note that the success of these intervention programs is accompanied by positive effects on the family. Parents report an improved sense of competence and lower levels of stress following such interventions.^{77,79,80} It is also important to emphasize that sleep problems in early childhood are very persistent if not treated.^{8,14} Therefore, early detection and intervention programs for sleep problems in early childhood should become an integral part of any health services for children.

Conclusions

Research has demonstrated that even pediatricians who often serve as the primary source of help for parents with sleep-disturbed children have limited knowledge and education in this field.^{81,82} Therefore, it is important to emphasize the need for extensive education of child-care professionals and parents in this area.

The following points highlight the main conclusions:

- Poor sleep can result from medical or behavioural-developmental factors.
- The prevalence of poor sleep and sleep-related disorders is very high in children.
- Poor sleep is associated with compromised neurobehavioural functioning and behaviour regulation in children.
- Children's sleep disruptions have a significant negative impact on the family.
- There are very effective behavioural and medical interventions to improve sleep and prevent sleep disruptions.
- Sleep problems in early childhood are very persistent if not treated.
- Early detection and interventions for sleep problems in children can facilitate child development, reduce family stress and improve parent-child relationships.

Implications

Child-care professionals should obtain training in screening sleep problems in young children. Screening for sleep problems could be performed by obtaining specific information on the child's sleep patterns and level of daytime fatigue. This information could be collected by interviewing the parents or by using specific screening

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questionnaires. Health services and education systems should have referral resources with experts trained in diagnosing and treating pediatric sleep problems. It is important that such resources be easily accessible to parents so that available effective prevention and early intervention methods can be implemented as early as possible.

It is important to consider educating young children about the importance of sleep. There is a growing health concern that children in our era are getting less sleep than they need and that many of them are chronically sleep-deprived. Early education about the importance of sleep may encourage children not to sacrifice sleep for other attractions.

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