Introduction to the Special Issue: Sleep in Children with Neurodevelopmental and Psychiatric Disorders

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The childhood shows the man,
As morning shows the day.
Paradise Regained, Book IV; John Milton (1608–1674)

For those clinicians and researchers who have chosen and embraced the challenges and rewards of working on a daily basis with children and families, the concept of “developmental context” is hardly a revelation. As with virtually any issue that pediatric practitioners confront in clinical settings or investigators examine in experimental settings or epidemiologic studies, sleep problems in childhood must be viewed in the context of normal physical and cognitive/emotional phenomena that are occurring at different developmental stages. For example, temporary regressions in sleep development often accompany the achievement of motor and cognitive milestones in the first year of life. Similarly, an increase in nighttime fears and night wakings in toddlers may be a temporary manifestation of developmentally normal separation anxiety peaking during that stage. In addition, sleep problems in the pediatric population must be viewed against a backdrop of the normal developmental trajectory across childhood and developmental norms; i.e., “normal” bedtime behavior, time to sleep onset, and sleep duration are obviously dramatically different in a 6-month old, 6-year old, and 16-year old. Finally, because the developmental continuum includes the transition into adulthood, insights into the prevalence, types, and impact of, as well as risk and protective factors for, sleep problems in childhood have direct relevance in regards to an increased understanding of sleep issues at all life stages.

Despite the obvious importance of viewing sleep problems in both children and adults from a developmental perspective, the body of literature in developmental aspects of pediatric sleep research at this juncture is still relatively sparse. For example, there are surprisingly little large-scale epidemiological data currently available, which systematically define normal sleep and wakefulness patterns and sleep duration in the pediatric population. Most of the existing studies have utilized subjective, parent-report, retrospective, cross-sectional surveys in selected populations. Although cross-sectional studies yield important information regarding sleep in discrete age groups, by their nature they neither describe the evolution and persistence of sleep/wake patterns over time, nor do they help to elucidate the complex reciprocal relationship between sleep and cognitive/emotional development from the prenatal period through adolescence. There are even more limited data from studies utilizing more “objective” methods of measuring sleep quality and duration, such as polysomnography and actigraphy; and many of these studies were conducted prior to the establishment of accepted sleep monitoring and scoring standards.

There are many potential reasons for this relative knowledge gap. First, as with many behavioral issues in childhood, the patient is rarely the one who presents with a chief complaint of a sleep problem. Thus, parental concerns and subjective observations regarding their child’s sleep patterns and behaviors often define sleep disturbances in the research, as well as in the clinical context. Parental recognition and reporting of sleep problems in children also varies across childhood, with parents of infants and toddlers more likely to be aware of sleep concerns than those of school-aged children and adolescents (and to report them to clinicians and researchers). Furthermore, the very definition of what behaviors constitute a sleep “problem” is often highly subjective and is frequently determined by the amount of disruption caused to parents’ sleep. Culturally based values and beliefs regarding the meaning, importance, and role of sleep in daily life, as well as culturally based differences in sleep practices (e.g., sleeping space and environment, solitary sleep vs. co-sleeping, use of transitional objects) also have a profound effect on how a parent
defines a sleep “problem,” as well as on the relative acceptability of various treatment strategies. Finally, the daytime sequelae of childhood sleep problems are often not easily defined or recognized, as excessive daytime sleepiness in children is frequently manifested as behavioral and/or neurocognitive dysfunction rather than as subjective complaints of sleepiness and fatigue or observations of “sleepy” behavior.

In addition to considering sleep disturbances within a developmental context, a number of other important child, parental, and environmental variables affect the type, relative prevalence, chronicity, and severity of sleep problems and further complicate the issue (Fig. 1). Child variables that may significantly impact sleep include temperament and behavioral style, cognitive and language abilities, individual variations in circadian preference, and the presence of comorbid developmental, medical, and/or psychiatric conditions. For example, bedtime problems are often associated with child temperament; “fussy” children may insist on a particular type of soothing/sleep-inducing technique, resisting any alternative that is less dependent on the caregiver. Parental variables include parenting and discipline styles, mental health issues such as maternal depression, medical issues, family stress, parents’ education level and knowledge of child development, and quality and quantity of parents’ sleep, as well as differences between mothers and fathers in regards to perception of their child’s sleep. Some caregivers may have their own issues (e.g., mental illness, long work hours) that interfere with their ability to set clear limits both during the day and at bedtime. In other cases, there is a “mismatch” between parental expectations regarding sleep behaviors and the normal developmental trajectory. Environmental variables include the physical sleeping environment (space, noise, perceived environmental threats to safety, sleep surface, room, and bed sharing), family composition (number, ages, and health status of siblings and extended family members), lifestyle issues (parental work status, competing priorities for time, household rules, and even socioeconomic status).

The articles in this second special issue on sleep in the Journal of Pediatric Psychology provide ample evidence of both the unique challenges involved in and the invaluable insights to be gained by approaching sleep research from a developmental perspective, and represent a step forward in our understanding of a number of important concepts. The wide range of psychiatric and neurodevelopmental disorders included in the issue’s original research articles and review (autism spectrum disorders, attention-deficit–hyperactivity disorder, early-onset bipolar disorder, major depressive and anxiety disorders, and high-risk birth factors) serves as testimony to the recognition that virtually every neurobehavioral and neurocognitive condition of childhood is potentially linked to sleep problems, and that, furthermore, the link is likely to be a bidirectional one. The implications these findings have for clinical practice is clearly illustrated, for example, in Lofthouse et al.’s web-based survey (Lofthouse, 2008) of sleep problems in children with early onset bipolar disorder. In this study, an astonishing 99% of parents reported at least one sleep problem occurring more than twice a week, which, equally importantly, was associated with significant psychosocial impairments in these children across settings.

The intriguing and increasingly empirically supported possibility that childhood sleep problems may serve as early markers for or prodromal symptoms of later psychopathology is also highly significant from the perspective of both adults and children. Chorney et al.’s review (2008) of the complex interplay of sleep disturbances, anxiety, and depression provides a jumping-off point for what clearly needs to be an ongoing discussion and exploration of the relationships among mood regulation, psychosocial factors, stress and arousal, cognition, and sleep that are likely to persist into adulthood. Chorney and colleagues also highlight the need for longitudinal studies to begin to elucidate these relationships. Alternatively, factors in early life which place children at risk for neurodevelopmental disabilities (e.g., very low birth weight) may have both short term and longitudinal effects on sleep patterns and difficulties, as examined in studies by Scher (2008) and Strang-Karlsson and colleagues (2008). While the results of these studies provide some reassurance that sleep disturbances are not inevitable in all high-risk children, they also provide additional

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**Figure 1.** Factors influencing “optimal” sleep in childhood.
insight into which factors may constitute specific risk factors for sleep problems within these at-risk groups.

Particularly relevant to understanding the intimate relationship between sleep in children and adults is the emphasis in most of these studies on parent–child factors. Two of the studies (Meltzer, 2008; Scher, 2008) specifically target sleep disturbances in caregivers as a reflection of and response to sleep disturbances in their children, elegantly demonstrating the importance of considering reduced sleep quality and quantity in caregivers of children with special needs as risk factors for increased stress and decreased quality of life in these families. In addition, Meltzer’s study explores differences in the impact on mothers’ and fathers’ sleep patterns, further deepening our understanding of how parenting styles may influence sleep patterns in both children and caregivers. Parental reports of their child’s sleep also figure prominently as a measurement tool in most of these studies. As Meltzer’s and Corkum et al.’s (2008) articles and Sadeh’s commentary (2008) in this issue point out, subjective parental observations do not always mirror data obtained from more “objective” measures of sleep such as actigraphy; on the other hand, both methodologies have unique contributions to make and should ideally be viewed as complimentary rather than discrepant measurement tools. In addition, the use of new and novel methodologies, such as web-based surveys (Lofthouse, 2008) and ecological momentary assessment (Whalen, 2008) are likely to further enrich our understanding of how sleep problems are defined and experienced by children and families in naturalistic settings.

Finally, two of the studies in this issue (Corkum, 2008; Whalen, 2008) examine the impact of pharmacologic agents on sleep in children and adolescents. Although drug effects on sleep and the efficacy of drugs for sleep have been well-studied in adults, similar data are almost completely lacking in the pediatric population. Yet, an increased understanding of the interactions, in particular among underlying psychopathology (i.e., depression, ADHD), commonly used psychoactive agents (i.e., caffeine and psychostimulants), and sleep during development is likely to yield important information about how these relationships play out in adults as well. From a clinical perspective, these findings highlight the need for mental health practitioners to recognize the potential effect of drugs on both sleep and daytime functioning, and to incorporate methods of assessing this impact in clinical practice.

There is clearly much yet to learn about the nature and impact of childhood sleep problems, and further elucidation of these fundamental questions regarding the nature of sleep disturbance in children is likely to contribute significantly to our understanding of the relationship between specific brain functions, regulatory systems, sleep, and daytime behavior in the developing human. Key areas for future research include the elucidation of the scope, magnitude, natural history, and impact of sleep disturbances in children and adolescents in the general population as well as those children with behavioral and developmental disorders; relative risk and protective factors (e.g., temperament, parenting styles, and psychosocial adversity) influencing the development of childhood sleep problems; the efficacy of various prevention strategies and treatment modalities in children, including behavioral interventions and pharmacotherapy; and the impact of treatment on the natural history of sleep disturbances into adulthood. Large-scale epidemiologic studies of typically developing children and those with diagnosed sleep disorders (i.e., patient “registries”) will be needed to accomplish these goals. It will be particularly important to develop a more comprehensive nosology to describe and categorize the various types of pediatric sleep disturbances for both clinical and research purposes; these classification systems will need to accurately capture both the similarities and distinctions between adult and pediatric sleep disturbances, as well as to differentiate normal developmental variation from “pathology” across the age spectrum. Evidence-based clinical screening and evaluation tools for sleep problems in children, which are easily adapted to primary care and outpatient mental health settings need to be developed, systematically evaluated, and disseminated, coupled with educational interventions for caregivers and providers targeted at raising awareness of the significance of pediatric sleep issues. Finally, the substantial impact of childhood sleep problems clearly deserves further study, ranging from effects on neuroendocrine systems and metabolic pathways related to the development of obesity, to neurocognitive deficits, to functional consequences related to learning, academic performance, family and peer relationships, and the public health care burden related to health care costs and lost productivity of both patient and caregivers.

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References


