



Supporting sleep in early care and education: an assessment of observed sleep times using a sleep practices optimality index

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ARTICLE INFO

Article history:

Received 17 July 2015

Received in revised form 25 November 2015

Accepted 3 December 2015

Keywords:

Napping
Environment
Practices
Early childhood
Education
Childcare
Sleep

ABSTRACT

Aim: The aim was to investigate whether the sleep practices in early childhood education (ECE) settings align with current evidence on optimal practice to support sleep.

Background: Internationally, scheduled sleep times are a common feature of daily schedules in ECE settings, yet little is known about the degree to which care practices in these settings align with the evidence regarding appropriate support of sleep.

Methods: Observations were conducted in 130 Australian ECE rooms attended by preschool children (*Mean* = 4.9 years). Of these rooms, 118 had daily scheduled sleep times. Observed practices were scored against an optimality index, the Sleep Environment and Practices Optimality Score, developed with reference to current evidence regarding sleep scheduling, routines, environmental stimuli, and emotional climate. Cluster analysis was applied to identify patterns and prevalence of care practices in the sleep time.

Results: Three sleep practices types were identified. *Supportive* rooms (36%) engaged in practices that maintained regular schedules, promoted routine, reduced environmental stimulation, and maintained positive emotional climate. The majority of ECE rooms (64%), although offering opportunity for sleep, did not engage in supportive practices: *Ambivalent* rooms (45%) were emotionally positive but did not support sleep; *Unsupportive* rooms (19%) were both emotionally negative and unsupportive in their practices.

Conclusions: Although ECE rooms schedule sleep time, many do not adopt practices that are supportive of sleep. Our results underscore the need for education about sleep supporting practice and research to ascertain the impact of sleep practices in ECE settings on children's sleep health and broader well-being.

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Introduction

Daytime sleep is an important feature of sleep patterning across early childhood and significant for children's health, behavioral regulation, and learning.¹ The period from birth to 5 years is characterized by a normative transition in daytime sleep during which there is an evident shift from multiple bouts of daytime sleep through to consolidation of all sleep into a single night period.² Although normative, individual difference in the rate at which this transition is accomplished is considerable and affected not only by biological mechanisms but also by a range of environmental, social, and behavioral factors.³ Whereas homeostatic sleep drive and circadian timing provide the biological conditions for sleep, the environments within which sleep occurs can serve to promote or inhibit sleep onset and have influence on sleep quality.^{4,5} The focus of the current study is daytime sleep in early childhood education (ECE) settings where sleep times are a common feature of the

daily routine.^{6–8} We analyze observation records from a corpus of 130 preschool rooms to examine how care practices in these settings align with current evidence regarding appropriate support of sleep.

Optimal conditions to support sleep

The evidence regarding practices and environments that support children's sleep is based on studies of nighttime sleep but can also be applied to the context of daytime sleep. To date, although scheduling of sleep is common practice in ECE, there is no published evidence on the care practices and environments used to support sleep or of the degree to which these align with evidence on optimal practice. We commence by reviewing the evidence to guide assessment of optimal practices for supporting sleep in ECE. We focus on 4 key domains identified in the literature to affect the presleep and sleep environment: scheduling, routines, environmental stimuli, and emotional climate. This body of literature is applied in our study to develop a sleep practices optimality index by which to assess practice.

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Sleep scheduling

Sleep scheduling includes the regularity and duration of sleep and also respect child's sleep duration. Regular scheduling of sleep is acknowledged as an integral principle of positive sleep practices.⁹ Regular bedtime, rise time, and sleep duration have been linked to behavioral adjustment in children.¹⁰ One theory behind the link between sleep scheduling and behavior is that irregular bed and rise times might disturb the circadian entrainment. Children have a developing circadian system and, when exposed to irregular sleep scheduling, may experience tiredness and attendant adverse effects on child behavior and learning.^{9–13} To date, there is limited evidence specifically focused on the impact of practices in ECE settings. Experimental studies in which children have been subjected to controlled disruption of their habitual napping report adverse effects on learning and behavior following disruption.^{14,15} These studies do not, however, provide evidence regarding the effects of typically occurring practices. One ethnographic study from Finland provides detailed naturalistic observation in 2 ECE settings.¹⁶ This work identifies the importance of regularity of sleep patterning, flexibility of sleep provision in the childcare context to synchronize with the individual child's circadian pattern, and awareness of the significance of ultradian rhythms in determining sleep duration and avoiding abrupt waking. These assessments of optimal practice in ECE settings, therefore, provide evidence of maintenance of regularity in daily sleep schedules and respect for individual sleep duration, including avoidance of abrupt waking, is indicated.

Sleep routines

Routines are activities that are associated with the commencement of sleep time and serve to reduce stress and increase predictability for children.^{10,17} Such routines lead to a decrease in arousal levels and result in shorter sleep onset latency and an overall improved quality of sleep. Galland and Mitchell¹⁸ suggest that, for night bedtime routines to be most successful, they should extend beyond stable start and end time to include a consistent association with a presleep activity that is low in stimulation and signals transition to sleep. In contrast, activities preceding sleep that are boisterous or mentally exciting and that arouse the individual and heighten physical and emotional states may inhibit sleep. Translation of these findings to the context of daytime sleep in ECE identifies optimal practice as one in which there are consistent routines that reduce arousal states and signal the approach of sleep time.

Stimulus in the sleep environment

Activities that occur within the sleep environment have an important influence on the opportunity to sleep and the quality of sleep experienced.⁹ Two key activities noted within the current literature relate to the positive effects of literacy-based activities such as reading and the negative effects of activities involving screen-based media. Hale and colleagues⁵ in an analysis of a large longitudinal study of disadvantaged preschoolers found that the inclusion of literacy-based activities was positively associated with sleep duration and quality. In contrast, the presence of screen technology has been consistently reported to reduce sleep duration and quality.^{13,18–20} There are 2 potential mechanisms that explain the association of sleep duration and quality with these activities. The first relates to arousal levels. Whereas reading a story serves to reduce arousal,⁵ screen-based technologies function to heighten emotional, cognitive, and physiological arousal by increasing levels of environmental light and sound, and exposure to emotional content.²¹ Second, these different activities may serve to promote⁵ or displace sleep.²¹ Whereas literacy-based activities signal the transition to sleep and, in young

children, involve the emotional and supervisory presence of an adult, screen technologies have been found to be an alternative to sleep in which their presence in bedrooms serves to delay sleep onset, shorten duration, and disrupt sleep quality.^{19,20} In ECE settings, literacy-based activities are common, although screen-based technologies are increasingly present.²² Their use within the sleep time in ECE has not been systematically documented; however, the evidence is sufficient to include the presence of literacy-based activities and the absence of screen-based activities as optimal conditions to support sleep during naptime.

Emotional climate

Arousal levels within the sleep environment are also affected by adult caregivers whose behaviors set the emotional tone surrounding sleep.⁵ A calm emotional climate can facilitate sleep,⁹ whereas an environment that is threatening or punitive may limit sleep and may become associated with sleep disorder.^{9,13,23} A recent study of ECE environments reported that the emotional climate during sleep time in childcare settings was significantly lower compared with non-sleep times with higher incidence of child distress and increased need for behavioral intervention by a teacher.²⁴ There was, however, variability in the management of sleep times. Centers scheduling prolonged sleep times without alternative activity for nonsleepers were found to have lower emotional climate, whereas those with more flexible timing and provision of quiet activities for nonsleepers had higher emotional climate. Disruption and distress of children within ECE rooms have been reported to occur alongside coercive and punitive methods to keep children in their beds and can disrupt the sleep of other children in the room.^{24,25} In contrast, positive behaviors such as gentle and respectful communication within classrooms have been observed to provide a calm and emotionally supportive environment.^{25,26} Accordingly, assessment of sleep support should consider the emotional tone of supervising adults and respect for individual child needs and provision for nonsleepers.

In summary, current evidence suggests that optimal environments for the support of children's sleep are: characterized by appropriate scheduling, the provision of presleep routines that signal the commencement of the sleep period; presence of activities that reduce stimulation and remove arousing activities; and caregiver practice that maintains calm and are free of threatening or punitive behaviors. In the current study, we apply these principles to assess the extent to which sleep practices in ECE settings align with current research evidence.

Method

Sample

A corpus of observations from 130 ECE rooms catering for preschool-aged children ($n > 2000$) 3.5 to 6 years old ($Mean = 4.9$ years) was assessed. Twelve rooms that did not have a scheduled sleep time during the day were excluded, providing a final sample of 118 observations. All rooms were participating in the Effective Early Education Experiences for Children (E4Kids) study, a longitudinal study of a representative sample of Australian ECE settings.²⁷ The sleep patterns of children within these rooms have been previously reported.^{24,28}

Measures

Observations

Analysis was of records from observations conducted during sleep times in E4Kids rooms.²⁹ Permission to conduct this research was obtained through the University Human Ethics Research Committee, and written consent was provided by the service director and

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