The Longitudinal Association of Young Children's Everyday Routines to Sleep Duration

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ABSTRACT

Introduction: Everyday routines promote children's health. In the present study, we examined whether children's participation in everyday routines at ages 4 and 6 years predicted their sleep duration at age 6 years.

Method: A secondary analysis of data was performed for 177 families who participated in the Rochester Preschool Children Injuries Study. Mothers were interviewed when their children were ages 4 and 6 years and reported on their children's everyday routines and perceived sleep duration. Relationships were examined by multiple hierarchical regression analysis.

Results: It was found that children who participated in more frequent routines at age 4 years were more likely to do so at age 6 years. Children's inadequate sleep duration at age 6 years was predicted by less frequent routines at age 6 years and by inadequate sleep duration at age 4 years after controlling for mothers' ethnicity, mothers' education, and family structure. An indirect relationship of routines at age 4 years to sleep at age 6 years through routines at age 6 years was found.

Discussion: Continuous engagement in everyday routines seems to play an important role in children's sleep acquisition. J Pediatr Health Care. (2014) *28*, 80-87.

KEY WORDS

Routines, sleep, children

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Sleep is essential for a child's physical growth and optimal functioning. The National Sleep Foundation (2009) recommends that preschool children, ages 3 to 5 years, sleep about 11 to 13 hours every night. However, national surveys from around the world reveal that children sleep fewer hours every day than those recommended, and parents often report sleep problems such as difficulties around bedtime (e.g., going to bed and staying in bed), falling asleep, and staying

asleep through the night (Liu, Liu, Owens, & Kaplan, 2005; Mindell & Owens, 2003). An estimated 50% of parents surveyed in the United States reported such sleep problems every day, and 77% reported sleep problems at least one night a week (Mindell, Carskadon, Chervin, & Meltzer, 2004). Similarly, among Australian families surveyed, one in five children was affected with night wakings, and one in eight children had difficulty falling asleep (Hiscock, Canterford, Ukoumunne, & Wake, 2007).

Short sleep duration and sleep problems put children at risk for physical and behavioral problems. Insufficient sleep increases a child's risk for becoming overweight (Carter, Taylor, Willliams, & Taylor, 2011; Spruyt, Molfese, & Gozal, 2011), sustaining an unintentional injury (Boto et al., 2012; Koulouglioti, Cole, & Kitzman, 2008), and experiencing both internalizing and externalizing behavior problems (Hall, Scher, Zaidman-Zait, Espezel, & Warnock, 2012; Reid, Hong, & Wade, 2009). Sleep also has an impact on executive functioning, with lack of sleep being related to attention deficits (Sadeh, Gruber, & Raviv, 2002) and children being inattentive and tired during the day (Fallone, Acebo, Arnedt, Seifer, & Carskadon, 2001; Vriend et al., 2012). It is also possible that the effect of sleep on executive function could partially explain the documented relation of sleep problems to children's academic underperformance (Curcio, Ferrara, & De Gennaro, 2006).

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Many sleep problems in children are related to poor sleep practices, including the absence of a regular bedtime routine, inconsistent sleep and wake-up times, poor quality of sleep environments, and activities that either interfere with sleep (e.g., a TV in a bedroom and consumption of caffeinated drinks) or reduced exercise (e.g., extensive TV viewing; Hale, Berger, LeBourgeois, & Brooks-Gunn, 2009; LeBourgeois, Giannotti, Cortesi, Wolfson, & Harsh, 2005; Paavonen, Pennonen, Roine, Valkonen, & Lahikainen, 2006). The use of electronic media such as video games, computers, and television viewing has been found to relate with shorter sleep duration and delayed bedtime among school-age children and adolescents (Cain & Gradisar, 2010), and the negative effects of media use on children's health, including aggressive behavior, lack of attention, and obesity have been attributed to insufficient sleep (Barlett, Gentile, Barlett, Eisenmann, & Walsh, 2012).

Preschool-age children with regular and consistent bedtime routines usually have less difficulty falling asleep and staying asleep through the night (Mindell, Meltzer, Carskadon, & Chervin, 2009); therefore the early establishment of bedtime routines is considered critical in ensuring adequate sleep acquisition among young children. Unpredictable timing and frequency of everyday activities cultivates insecure feelings and undermines sleep acquisition, possibly by increasing the child's anxiety and by not providing the necessary cues for going to bed.

Routines are observable, repetitive behavior patterns. Maintenance of routines is believed to be protective of a child's health through the provision of structure and by facilitating adjustment during transitional periods (Zisberg, Young, Schepp, & Zysberg, 2007). Children living in unpredictable and less routinized home environments, as described by the ecological theory, are at risk for adverse outcomes. The ecological theory states that children's socioemotional functioning and sleep acquisition are particularly at risk for children living in chaotic home environments characterized by lack of structure, lack of routines, and high levels of noise (Bronfenbrenner & Evans, 2000; Evans, 2006). Preschool children living in noisy home environments have been found to go to bed later, to sleep fewer hours, and to have more difficulty falling asleep (Bruni, Novelli, & Ferri, 2011).

Everyday routines are particularly challenging during the preschool years when children become more active participants in family life. During this developmental period, young children are ready to share and voice their opinions about food choices and when, where, and how to go to sleep (Fiese, 2006). In addition, mothers' education, mothers' ethnicity, and family structure are related to the frequency and nature of everyday routines (Flores, Tomany-Korman, & Olson, 2005). Higher maternal education is positively related to school-age children's educational activities (Hofferth & Sandberg, 2001), more frequent family routines (Churchill & Stoneman, 2004), and an increased probability for daily reading (Kuo, Franke, Regalado, & Halfon, 2004). Mothers with a college degree report more frequent routines compared with those who have a high school diploma (Koulouglioti, Cole, & Kitzman, 2009), and single-parent families report fewer routines compared with two-adult families (DeMore, Adams, Wilson, & Hogan, 2005; Koulouglioti et al., 2009). In addition, rates of bedtime routines have been found to be slightly lower in African American and Latino families than in White families with preschool children (Milan, Snow & Belay, 2007).

It is often said that "children thrive on routines," but despite its popularity, this hypothesis is not often tested. In addition, very few studies have explored the stability of routines over time and its positive consequences for children. Stability of routines over time has been found to positively relate with children's academic achievement and negatively with behavior problems and