Prevalence of attention-deficit/hyperactivity disorder symptoms and their associations with sleep schedules and sleep-related problems among preschoolers in mainland China.

Cao H, Yan S, Gu C, Wang S, Ni L, Tao H, Shao T, Xu Y, Tao F.

Abstract

BACKGROUND:
Attention-deficit/hyperactivity disorder (ADHD) among children is an increasing public health concern. The identification of behavioral risk factors, including sleep quality, has important public health implications for prioritizing behavioral intervention strategies for ADHD. Herein, this study aimed to investigate the prevalence of high levels of ADHD symptoms and to explore the association between sleep schedules, sleep-related problems and ADHD symptoms among preschoolers aged 3 to 6 years in mainland China.

METHODS:
A cross-sectional study was conducted, comprising a large sample of 15,291 preschoolers in Ma'anshan city of Anhui Province in China. ADHD symptoms were assessed by the 10-item Chinese version of the Conners Abbreviated Symptom Questionnaire (C-ASQ). Sleep-related variables included caregivers' responses to specific questions addressing children's daytime and nighttime sleep schedules, as well as sleep-related behaviors. Data on other factors were also collected, such as socio-demographic characteristics, TV viewing duration on weekdays and weekends, and outdoor activities. Logistic regression models were used to analyze the relationships between sleep schedules, sleep-related problems and ADHD symptoms.

RESULTS:
Approximately 8.6% of the total sample of preschoolers had high levels of ADHD symptoms, with boys having higher levels than girls (9.9% vs. 7.2%). In the logistic regression analysis, after adjusting for TV viewing duration, outdoor activities, and socio-demographic characteristics, delayed bedtime was significantly associated with a risk of high levels of ADHD symptoms, with odds ratios (OR) of 2.50 [95% confidence interval (CI): 2.09 ~ 3.00] and 2.04 (95% CI: 1.72 ~ 2.42) for weekdays and weekends, respectively. Longer time falling asleep ($\geq$ 31 min) (OR = 1.76, 95% CI: 1.47 ~ 2.11), no naps (OR = 1.57, 95% CI: 1.34 ~ 1.84) and frequent sleep-related problems (OR = 4.57, 95% CI: 3.86 ~ 5.41) were also significantly associated with an increased risk of high levels of ADHD symptoms, while longer sleep duration (> 8.5 h) was associated with a decreased risk of high levels of ADHD symptoms (OR = 0.76, 95% CI: 0.67~ 0.87).

CONCLUSIONS:
ADHD symptoms are prevalent in preschoolers in Ma'anshan region, China. Undesirable sleep schedules and sleep-related problems among preschoolers confer a risk of ADHD symptoms, highlighting the finding that beneficial and regular sleep habits potentially attenuate ADHD symptoms among preschoolers.