Sleep and Obesity in Childhood

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Sleep deprivation in adults has been recognized as one of the key risk factors for the development of complications related to obesity and metabolic syndrome. Indeed, numerous observational studies have demonstrated an inverse association between the duration of sleep time and obesity in adulthood.^{1,2} Many studies have indicated that childhood obesity is also related to short sleep duration³, although there have been a number of dissenting reports in this regard.⁴ However, most systematic reviews have suggested that there is a relationship between short sleep time and the high prevalence of obesity in childhood.^{5,6} For instance, a large meta-analysis of 11 longitudinal studies showed that the risk of obesity in a pediatric group was 2.15 times higher in children with shortened sleep duration compared to children without short sleep duration.⁷

Appropriate sleep in childhood is known to have a lasting beneficial impact into adulthood, although the role of sleep during childhood is quite complicated. This is due to the various changes in sleep time duration and sleep behavior associated with both changes in growth and changes in lifestyle during childhood; thus, short sleep durations are predicted to affect different life-cycle stages in different ways. The adolescent period is associated with a higher risk of obesity compared to the pediatric period. Further, obese adolescents with short sleep durations are more likely to be associated with biological and lifestyle-related changes.

es.⁶ Sleep curtailment can also lead to reduced physical activity, daytime sleepiness, and increased food intake.⁸ Sleep deprivation in childhood may therefore be considered to be a significant predictor of obesity and behavioral sleep interventions can provide one way to reduce the risk of obesity.

In Korea, 75.3% of adolescents have reported experiencing sleep deprivation, and the rate of sleep curtailment has been shown to gradually increase with age.⁹ The prevalence of overweight risk has been reported to be higher in a group that had less than eight hours of sleep compared to a group who had more than eight hours of sleep.¹⁰

Energy homeostasis is the result of a combination of biological factors (i.e., circadian rhythms and sleep-wake homeostasis) and environmental factors (i.e., diet and physical activity). In the past few years, numerous studies have been conducted on the relationship between sleep-wake cycle regulation and metabolic function¹¹ and recent studies have also been conducted on the sleep dimensions associated with childhood obesity. Beyond sleep duration, sleeping timing patterns can also serve to increase obesity risk.¹² Although shifted sleep schedules and evening chronotypes have recently been found to be linked to adiposity in adults, related studies in children are remain rare. One study found that Korean middle school students who experienced so-called "social jet lag" tended to be more obese than elementary

school students who experienced the same condition.¹³

Sleep-obesity associations can potentially be explained by the mechanisms of eating timing, obesogenic eating behaviors, and changes in appetite-regulating hormones such as leptin and ghrelin. In the future, multidisciplinary interventions for sleep in childhood can play an important role in controlling the risk of developing both obesity and metabolic syndrome.

CONFLICTS OF INTEREST

The author declares no conflict of interest.

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