

Study shows the importance of when adolescents sleep to obesity and cardiometabolic health

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A new study led by researchers at Massachusetts General Hospital for Children (MGHfC) and Harvard Medical School has found that adolescent sleep timing preferences and patterns should be considered risk factors for obesity and cardiometabolic health, and that the effects are greater in girls than in boys.

Poor quality and short duration of sleep are known to increase obesity and cardiometabolic risk among children. What's rarely been studied, however, is how sleep timing and teens' own preferences for when to sleep and engage in other activities can influence their risk of obesity and poor cardiometabolic health.

"Beyond quantity and quality, timing is a vital component of sleep because it determines if an individual's circadian clock—the internal sleep/wake schedule—is synchronized with the rhythms of their daily activities," says Elsie Taveras, MD, MPH, division chief, General Academic Pediatrics,

MGHfC, and senior investigator of a new study published in *JAMA Pediatrics*. "This is particularly important to adolescents whose evening preferences and academic demands often result in irregular sleep schedules that may cause circadian misalignment. Our research found that 'night owls,' teenagers who prefer to go to bed late but have to get up early for school, had higher waist circumference and greater abdominal fat deposition (adiposity) than the 'morning larks,' those who prefer to go to bed early and get up early to begin their day."

The researchers emphasized the need for consistent sleep-wake patterns throughout the week, including on weekends, to reduce the risk of obesity and promote [cardiometabolic health](#).

The research team studied 804 children who were part of Project Viva, a groundbreaking cohort study begun 20 years ago by researchers at the Harvard Pilgrim Health Care Institute that followed Boston-area mothers and children to characterize early-life factors that influence long-term health. Scientists examined chronotypes (evening versus morning preferences) and "[social jet lag](#)" (differences in sleep timing between school and free days) in children 12 to 17 years of age. Evening chronotypes and greater social jet lag were associated with higher adiposity.

"Large variability in sleep patterns across the week can disrupt normal physiology, resulting in obesity and cardiometabolic risk," explains lead author Elizabeth Cespedes Feliciano, ScD, ScM, formerly at the Harvard Chan School of Public Health and now research scientist in the Kaiser Permanente Northern California Division of Research.

"Our study supports the importance of biological clocks in influencing obesity risk." Stronger

associations with adiposity were observed for girls versus boys. "While the reasons for that difference are not fully understood, they may include biological and sociocultural influences," says Feliciano.

Helping teenagers address the effects of chronotypes and social jet lag calls for family, clinical and community-based initiatives, according to the investigators. "Families should encourage consistency in their children's sleep schedules and their bed and wake times as well as improvements in their sleep hygiene by limiting electronic media and caffeine use in the evening," says Feliciano.

Schools can also play an important role by enacting policies that delay morning start times and by making it easier for students to devote time during the school day to academic or athletic activities that are spilling more and more into the late night, says Taveras. From a clinical standpoint, she adds, physicians should start to include chronotypes and social jet lag in their preventive counseling. "Physicians should be aware of the importance of encouraging adolescents to follow consistent sleep schedules on weekdays and weekends," she says. "Adolescent girls and 'owls' may especially benefit from keeping consistent sleep schedules."

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