

Sleep Deprivation in Adolescents and Young Adults

Sleep: How does it affect adolescents and young adults?

Sleep is essential to the healthy development of adolescents and young adults, as well as their success at school and in the workplace. In 2011, two thirds of adolescents reported insufficient sleep, as did one third of young adults.¹ In adolescence, insufficient sleep, inadequate sleep quality, and irregular sleep patterns are associated with daytime sleepiness, negative moods, increased likelihood of stimulant use, higher levels of risk taking behaviors, poor school performance, and increased risk of unintentional injuries.² Over a quarter of high school students report falling asleep in class at least once weekly.³ In young adulthood, a lack of sufficient sleep has been linked to poor self-rated health and psychological distress.^{4,5}

The growing evidence supporting the importance of sleep and the negative impact of sleep deprivation has brought the issue to the attention of public health professionals. Healthy People 2020, which sets the nation's public health agenda, included 'sleep health' as a [topic area](#), and developed objectives for sleep health, including: (1) Increase the proportion of students in grade 9 through 12 who get sufficient sleep and (2) increase the proportion of adults who get sufficient sleep (See box below for number of hours).¹ In this information brief, we discuss the definition of sufficient sleep, barriers to adequate sleep, ways to recognize sleep deprivation, and efforts to promote healthy sleep in adolescents and young adults.

How many hours are "sufficient" for adolescents and young adults?

Ages 12-17: 8 or more hours¹

Ages 18-21: 8 or more hours¹

Ages 22+: 7 or more hours

What are the signs of sleep deprivation?

The effects of ongoing sleep deprivation may include:

- Concentration difficulties
- Mentally 'drifting off' in class
- Shortened attention span
- Memory impairment
- Poor decision making
- Lack of enthusiasm
- Moodiness and aggression
- Depression
- Risk-taking behavior
- Slower physical reflexes
- Clumsiness, which may result in physical injuries
- Reduced sporting performance
- Reduced academic performance
- More 'sick days' from school because of tiredness
- Truancy

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commitments may further contribute to late bedtimes.

- **Leisure activities:** a stimulating environment, such as television, the Internet, and computer gaming delay a teenager's bedtime.
- **Light exposure:** light cues the brain to stay awake. In the evening, lights from televisions, mobile phones and computers can prevent adequate production of melatonin.

Why don't teenagers and young adults regularly get enough sleep?

Several factors contribute to lack of sleep in adolescence and young adulthood. Insufficient sleep during this critical growth period arises from physiological, behavioral, sociocultural, and environmental changes. Little is known about the influences on sleep among young adults. Factors known to affect adolescents often occur simultaneously, and include:

- **Hormonal time shift and early school start times:** In early adolescence, teens experience a shift in their circadian rhythms, causing the peak production of melatonin, a sleep-inducing hormone, to occur later in the evening, from around 11pm to 8am.⁶ The change in normal sleep cycles is further complicated by school schedules. Forty-two percent of public high schools start before 8:00am, and forty-three percent of public high schools start between 8:00am and 8:29am.⁷ These start times lead adolescents to start their day before they have slept the recommended 8 or more hours. Nearly 70% of adolescents report 7 or less hours of sleep on an average school night.⁸ This nightly 'sleep debt' can contribute to chronic sleep deprivation.
- **Hectic after-school schedule:** homework, sports, other extra-curricular activities, part-time work, and social

- **Vicious cycle:** insufficient sleep causes a teenager's brain to become more active. An over-aroused brain is less able to fall asleep.
- **Social attitudes:** in Western culture, keeping active is valued more than sleep.
- **Sleep disorder:** sleep disorders, such as restless legs syndrome or sleep apnea, can affect how much sleep a teenager gets.

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For Health Professionals: What Can Be Done?

Public health approaches to improve sleep hygiene thus far have ranged from school policy change to informational programs that aim to increase knowledge about sleep and improve adolescents' and young adults' sleep habits. Evidence for the effectiveness of most interventions is minimal for this emerging issue. Research on interventions involving parents is especially sparse. Descriptions of efforts to improve sleep health follow.

Delayed School Start Times: Description: Several

studies have examined the impact of delayed school start times on sleep and related problems. District-wide changes were implemented, with schools starting approximately 1.5 hours later in Minnesota and Massachusetts, and one hour later in Kentucky. **Evaluation:** The evaluations suggest that delayed start times is a promising strategy for increasing sleep time and related outcomes. Delayed start times in Minnesota, implemented in 1996, produced encouraging results, including longer sleep times, improved attendance, increase in continuous enrollment, less tardiness, and less students making fewer trips to the school nurse. Notably, urban and suburban parents differed in support for the change. Later school start times caused hardship by disrupting transportation and work schedules for urban students and parents, while suburban parents generally supported the change.⁹ In Kentucky (1998), delayed school start times appear to have led to a significant decrease in countywide car collision rates among teens.¹⁰ Delayed school start times implemented in Massachusetts in 2004 resulted in longer sleep times, improved academic performance, and reduced tardiness.¹¹ A 2013 study conducted in eight public schools in Minnesota, Colorado, and Wyoming found that starting school at 8:30am or later allowed for more than 60% of students to obtain at least eight hours of sleep per school night. Additional results included improved academic performance, reduced tardiness, and improved performance on state and national achievement tests. When schools shifted start times from 7:35 to 8:55 am, crashes among teen drivers ages 16-18 decreased by 70%.¹²

Sleep Education Leaflet: Description: This study was conducted among 1209 high school students ages 15-18 from 12 high schools in Croatia. An educational leaflet about healthy sleep was distributed to two intervention groups, one that received pre- and posttests and one that only received posttests. **Evaluation:** Positive effects on sleep knowledge, as measured by pre- and posttests, were found in students ages 15-17 but not aged 18. In male students, positive effects of the leaflet intervention was found only in the group that had not been pre-tested, while in female students, positive results were found in both pre-tested and not pre-tested groups.

InShape: Description: InShape emphasizes the positive image benefits of setting goals to increase physical activity, healthy eating, sleep, and stress management, while avoiding alcohol, cigarettes and illicit drugs to maintain a healthy lifestyle. Major program components include a self-administered behavior image survey, a brief talk about fitness and health with a designated Fitness Specialist, and a set of fitness recommendations and goal plan to improve fitness behaviors and future image. The program was administered to over 300 college students (ages 19-22). **Evaluation:** Results from a three-month follow up showed an increase in the duration of sleep, along with other health results.¹³

Personal Tips for a Better Night's Sleep:

Sleep hygiene, a variety of practices that are necessary to have normal quality sleep, is essential to the health of not only adolescents and young adults, but individuals of all ages. The following tips have shown to be effective at improving sleep hygiene for various ages:

- Get up and go to bed the same time every day
- Go to bed only when sleepy
- Develop sleep rituals
- Optimize your sleep environment (Keep room dark, Minimize noises, Moderate room temperature)
- Don't take your worries and responsibilities to bed
- If you can't fall asleep to the point of becoming frustrated, get up and do something relaxing until you feel sleepy
- Limit being in bed to times when you are sleeping, or sick
- Do not watch the clock
- Minimize napping
- Stay away from caffeine, nicotine, and alcohol at least 4-6 hours before bed
- Have a light snack before bed
- Refrain from exercise at least 2 hours before bed

Sleep HealthCenters

Mindfulness-Based Stress Reduction (MBSR): Description: Mindfulness-based stress reduction (MBSR) trains individuals to direct their attention to an event or experience, while avoiding evaluative thought or judgment, with the goal of alleviating stress and stress-related outcomes. MBSR was implemented with adolescents in an outpatient psychiatric program who had received a psychological diagnosis. Adolescents in the treatment group received MBSR, plus their usual psychiatric care. Controls received their usual psychiatric care. **Evaluation:** Results showed that those in the treatment group significantly improved their sleep quality, along with other outcomes.¹⁴

Conclusions and Recommendations

Despite growing evidence of youths' vulnerability to sleep deprivation, there have been relatively few effective interventions to improve sleep hygiene. Although some programs aim to improve sleep outcomes, very few health interventions for adolescents and young adults have focused exclusively on sleep. More interventions need to be developed and evaluated to reduce sleep problems for adolescents and young adults. Interventions should focus on the contexts affecting these youth, as well as the youth themselves.

Sources

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Additional Reading

- Pathways to adolescent health sleep regulation and behavior:** [http://www.jahonline.org/article/S1054-139X\(02\)00506-2/abstract](http://www.jahonline.org/article/S1054-139X(02)00506-2/abstract)
- The Sleepy Adolescent: Causes and Consequences of Sleepiness in Teens:** <http://www.ncbi.nlm.nih.gov/pubmed/18513671>
- Excessive Sleepiness in Adolescents and Young Adults: Causes, Consequences, and Treatment Strategies:** <http://pediatrics.aappublications.org/content/115/6/1774.full.html>
- Adolescents Living the 24/7 Lifestyle: Effects of Caffeine and Technology on Sleep Duration and Daytime Functioning :** <http://pediatrics.aappublications.org/content/123/6/e1005.abstract>

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