WHAT HAPPENS IF YOU DO NOT GET ENOUGH SLEEP?

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Good sleep is essential for a healthy lifestyle. The official recommendations for the length of a night’s sleep range from 7 to 9 h for adults and 10–13 h for children, depending on age. Based on this recommendation, many children and adolescents around the world do not get the recommended amount of sleep. In this article, we will review the reasons why young people are not getting enough sleep, discuss the effects of lack of sleep on brain function and emotions, and emphasize the benefits of adequate sleep for improving mood and optimizing performance in school. We will also examine how delaying the start of the school day could help increase overall sleep hours and reduce the negative consequences of sleep deprivation.
DO MOST PEOPLE GET ENOUGH SLEEP?

Sleep is an essential part of maintaining a healthy lifestyle, vital for all age groups—from infants and children to older adults. Insufficient sleep has both short- and long-term effects. In the short term, we all feel tired and uncomfortable when we do not sleep enough. In the long term, experts have found that regular lack of sleep is linked to a reduction in overall health. Sleep is essential for growth, physical and mental health, cognitive functioning, and mood balance. Although sleep’s importance has been proven, lack of sleep is still a worldwide problem, especially for adolescents.

The fundamental question is: how much sleep do we really need? Sleep associations around the world are trying to figure this out. The answer actually varies from person to person. Experts say that you should sleep enough to feel refreshed and alert during the day. For most of us, this means at least 9 h of sleep per night at elementary school age, and 8 h per night in adolescence [1]. Official recommendations state the following guidelines for children and adolescents: 10–13 h for 3–5-year-olds, 9–12 h for elementary school-aged children (6–12 years), and 8–10 h for middle school- and high school-aged kids (Figure 1) [2].

A related question is: what time should we go to bed? In general, there is no specific recommended time—only to go to bed when you are tired. However, as much as possible, it is very important to go to bed at the same time each night. Most young children go to bed around 8 pm and will fall asleep in <15 min. Adolescents often need fewer hours of sleep, but they will benefit if they go to bed around 10 pm. The key is to balance getting enough sleep with not lying awake in bed for too long.

Unfortunately, many children and adolescents do not get the recommended number of sleep hours. Several studies have shown that adolescents tend to sleep less as they get older. For example, 16% of 6th graders reported that they sleep <8 h a night; among 12th graders, the rate rose to 75% [1]. A study conducted in the USA from 2016 to 2018, examining the number of sleep hours in infants, children, and adolescents between the ages of 4 months and 17 years, found...
that about 35% of participants slept less than recommended for their age [3].

**WHAT IS KEEPING US AWAKE?**

There are many reasons that sleep deprivation is a worldwide phenomenon and these reasons can vary from person to person [1, 4]. Difficulties related to falling asleep, i.e., insomnia, can stem from various factors. However, every one of us can relate to at least one or two factors, and we might be able to change some of them to get more sleep (Figure 2).

![INSOMNIA CAUSES](image)

**Biological Factors**

Many changes happen in the body during puberty, including changes to the biological clock. One function of the biological clock is to control the timing between the sleep cycle and wakefulness. During puberty, there is a delay in the timing of the start and end of the sleep period, meaning kids want to stay up later and sleep later in the morning. Why does this happen? The pineal gland, located in the brain, produces a hormone called melatonin every evening. Melatonin, also known as the “hormone of darkness”, tells the body that it is time to go to sleep. During puberty, the production of melatonin is delayed, so teenagers tend to go to bed later and get up later.

We can see the biological clock at work in a common phenomenon known to many of us—jet lag. Jet lag is a temporary sleep disorder resulting from a rapid transition between time zones. It takes about half a day for the human body to get used to each hour of time difference between the point of origin and the destination point. That is, for a time difference of 6 h, we will experience jet lag for 3 days. As a result, we will be awake at the “wrong” hours, which makes it very difficult to function.
Certain Diseases
Migraines, allergies, and lung diseases such as asthma can damage the sleep cycle and cause sleep that is not refreshing. In puberty, kids often experience more anxiety, depression, and eating disorders, and these conditions may affect sleep as well.

Electronics
Exposure to electronic devices right before bedtime, including televisions or smartphones, decreases the quality of sleep and leads to excessive sleepiness during the day. The use of screens can postpone bedtime, and the light emitted by electronic devices disrupts melatonin secretion. The result is shorter and lower-quality sleep.

Work, Entertainment, and Studies
Adolescents are busy! Going to a part-time job, being active in youth groups or sports, spending time with friends, doing homework, and studying for tests can shorten sleeping hours and contribute to a feeling of stress. Stress can further harm the quality of sleep.

Stimulants and Medications
Caffeine, found in coffee, chocolate, tea, and energy drinks, has a stimulating effect on the body, and it may disrupt sleep and cause excessive sleepiness during the day. It is recommended that caffeinated drinks should not be consumed at least 6 hours before bedtime.

Many medications also cause sleep problems and excessive daytime sleepiness. These include prescription and over-the-counter stimulants such as ADHD drugs, drugs for the treatment of certain diseases such as epilepsy, allergy drugs, painkillers, and more. Taking medication at the correct time can improve sleep.

WHAT HAPPENS WHEN WE DO NOT SLEEP ENOUGH?
Could it be okay to not sleep? After all, we could “waste” less time if we did other things instead of sleeping. Let us examine how lack of sleep may affect our bodies (Figure 3) [1, 4].

Mood and Behavior
An insufficient amount of sleep is linked to an increase in sleepiness and feelings of tiredness during the day, sharp mood swings, symptoms of anxiety and depression, and an increased frequency of suicidal thoughts. Irregular sleeping hours and lack of sleep are linked to an increase in risky behaviors such as drinking alcohol, smoking cigarettes, and using drugs. These behaviors, in turn, may further harm the timing and quality of sleep. Daytime sleepiness can lead to car accidents, work accidents, and sports injuries.
Be aware of symptoms of sleep deprivation!
Symptoms include: feeling tired during the day, mood swings, weight gain, lack of concentration, and frequent illnesses (which also increases absences from school) [Image credit: taken from a post uploaded to the Facebook page of the Indian oil and natural gas corporation, Hindustan Petroleum, on World Sleep Day 2023].

Cognitive Functioning and Academic Performance
Adolescents who suffer from a lack of sleep report a decrease in cognitive functioning and can have difficulty concentrating at school, resulting in decreased academic performance. Sleep deprivation is so common in children that some are diagnosed with attention deficit disorder even though the real problem is a lack of sleep. Lack of sleep can be reflected in poor grades, increased absences, and difficulty concentrating in class. These are just some of the negative side effects of an insufficient amount of sleep on the brain.

Obesity
As with adults, lack of sleep among children and adolescents is linked to obesity. When the body is in a state of sleep deprivation, there are hormonal changes and changes to the body’s metabolism. These changes can make people feel hungrier than normal. So, the less you sleep, the hungrier you are, and the more you eat. Obesity is often associated with a collection of symptoms including a fatty liver and high blood pressure, and it can increase the risk of developing diabetes and heart disease.

DOES STARTING SCHOOL LATER HELP?
There have been many studies on delaying school start times, to see if such delays might help prevent lack of sleep among children and adolescents. A growing number of schools all over the world are implementing late-start programs to adapt the school day to the delayed circadian rhythm of adolescents and teenagers. Many U.S. states have passed laws requiring that classes in middle and high
schools may not begin before 8:30 am [5]. Adolescents in these states reported sleeping for more hours. More importantly, their improved sleep helped with some of the negative effects of sleep deprivation, including increased positive mood, reduction in school absences, weight loss, reduced intake of caffeine, better grades, and even fewer traffic accidents involving teenagers [1, 5]. Changing school hours is challenging, though, so not all areas can do this. We also still do not know exactly how long the start of the school day should be delayed to gain the positive effect.

CONCLUSION AND RECOMMENDATIONS

Will we soon see schools everywhere implement a later start time? Maybe, but in the meantime, each and every one of you needs to take care of your personal sleep hours. Remember: even an extra hour of sleep at night can work like magic—your mood could improve, your grades might go up, and you will probably feel refreshed and healthier.

So, to improve your sleep, remember: stop using screens about 2 h before bed (try reading a book instead), avoid caffeinated beverages after 4 pm, get some exercise during the day—go for a run or a swim, and, if you are still having trouble sleeping, talk to your parents or doctor.

Finally, here are some tips to help you overcome jet lag on your next vacation: A few days before the flight adjust your bedtime to the new clock, go to bed slightly later than usual (for a westbound flight), or a bit earlier (for an eastbound one). Upon your arrival at the new destination, spend time outside in the daylight.

Good night and sleep tight!

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**YOUNG REVIEWERS**

**HILA, AGE: 14**
I study in an honors class at Haim Guri School in Netanya. In the afternoons I like to do art, swim, and sometimes run. In addition, I play the piano and music is a big part of my life. I also love traveling and discovering new places.

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