

Along with food, water and oxygen, people cannot live without sleep. Yet, one

in three Americans reports not getting enough sleep, contributing to what the Centers for Disease Control and Prevention has called an epidemic. Deficient shuteye — meaning not enough or low quality — has been linked to poorer dietary choices, increased risk of chronic

diseases, decreased lifespan and reduced psychological well-being, suggesting that sleep should be higher up on everyone's to-do list.

The Architecture of Sleep
Research suggests sleep may help remove toxins from the brain that build up during waking hours. Sleep also may help with learning new information, making memories and regulating emotions. Although sleep patterns change as we age,

a full night of sleep consists of cycling through the sleep stages: stage 1, 2, 3 and rapid eye movement sleep, or REM.

A joint consensus statement of the American Academy of Sleep Medicine and Sleep Research Society recommends adults get seven or more hours of sleep each night. In addition to enough sleep, quality is important. Indicators of poor sleep quality include frequently waking during the night, not feeling rested after a full night of sleep or episodes of snoring or gasping for air, which may indicate a serious sleep disorder.

Sleep and Food Choices

A lack of sleep may result in making poor food choices, eating too many calories and a higher risk of being overweight or obese. Not getting enough sleep can lead to an increase in ghrelin, a decrease in leptin or both. Leptin and ghrelin are hormones that are key in regulating appetite and food intake. In short, an increase in ghrelin means an increase in hunger and an increase in leptin means an increase in satiety or fullness.

Some research suggests not getting enough sleep may make the brain more sensitive to food stimuli, such as sights and smells, and may find food more rewarding. Not getting enough sleep also may increase the brain's endocannabinoids, increasing hunger and appetite. Additionally, less sleep may alter resting metabolic

THE ROLE OF *sleep in health*

Why everyone should make sleep a priority

By Esther L. Ellis, MS, RD, LDN



rate — the total number of calories burned at rest and needed for basic bodily functions such as breathing. While these findings are all results of studies, most featured small sample sizes, so more research is needed.

Along with the more complicated hormonal and cerebral theories of why inadequate sleep leads to overeating comes a simpler explanation: Less sleep means more time awake, which means more time to eat.

Sleep and Health

Increases in chronic disease and deficient sleep have many scientists wondering how, or if, the two are related. So far, not enough sleep or low-quality sleep have been linked to chronic diseases such as obesity, Type 2 diabetes, cardiovascular disease, depression and other conditions including impaired immunity, social isolation, overall well-being, mortality and even suicide.

Diabetes

Lack of sleep from obstructive sleep apnea (which causes periods of stopped breathing) and other sleep disorders can lead to decreased insulin sensitivity and reduced insulin production. To compound these effects, lack of sleep also can lead to an increase of stress hormones, preventing insulin from functioning properly. Over time, increased glucose in the bloodstream (and obesity) can raise the risk of developing Type 2 diabetes.

Heart Disease

Since blood pressure decreases during sleep, a lack of sleep

Sleep Disorders

INSOMNIA: An inability to initiate or maintain sleep.

NARCOLEPSY: Excessive daytime sleepiness that includes “sleep attacks” or irresistible sleepiness.

RESTLESS LEG SYNDROME: A “creeping” sensation or aches and pains in the legs when at rest.

SLEEP APNEA: Periodic and temporary pauses in breathing or obstruction of the airway.

keeps blood pressure higher for longer periods, increasing risks for hypertension. Obstructive sleep apnea limits the amount of oxygen in the body, which can increase risk for stroke, heart attack and high blood pressure. Sleep apnea and sleep disorders may be linked to hardening of the arteries and an irregular heartbeat.

One epidemiological study found deficient sleep is connected to decreased HDL and increased LDL, suggesting that a lack of sleep can interfere with cholesterol metabolism. However, some experimental studies show mixed results.

Immunity

Some science suggests sleep deprivation can reduce the body’s ability to build up defenses against illness. One study found the immune systems of participants with healthy sleep were better at “remembering” a virus and had an enhanced ability to attack it, compared to those who did not get enough sleep.

Other studies have shown insufficient sleep can result in increased white blood

cell count, indicating inflammation. Not getting enough sleep can increase inflammatory markers, stimulate immune cells and prolong recovery.

Overall Well-Being

While stress can interfere with sleep, the reverse is also true: Lack of sleep can increase stress. One study found deficient sleep interfered with processing emotions, suggesting that people who do not get enough sleep may be less capable of empathy. According to the National Institutes of Health, sleep disorders may be linked to attention-deficit hyperactivity disorder, or ADHD.

People with insomnia and obstructive sleep apnea are significantly more likely to experience depression compared to individuals with healthy sleep. Not getting enough sleep and poor-quality sleep can lead to social isolation, which can lead to loneliness. Studies suggest individuals with deficient sleep also are at higher risk of suicide.

Mortality

Short sleep duration and long sleep duration are associated with an increase in all-cause mortality, meaning too much or too little sleep can increase risk of death. A meta-analysis of 57 studies found a U-shaped association between how long an individual slept and risk of death; the lowest risk was around seven hours of sleep.

Children

Growing research shows that children with deficient sleep are at higher risk of obesity, Type 2 diabetes, mental health and behavioral problems. Children ages 6 to 12 need nine to 12 hours of sleep each night, while 13- to 18-year-olds need eight to 10 hours of sleep. Teens who do not get enough sleep may exhibit more risky behaviors, such as texting while driving or riding in the car with someone who has been drinking alcohol. The CDC estimates that 60 percent of middle schoolers and 70 percent of high schoolers do not get enough sleep.

Esther is an associate editor of *Food & Nutrition*.

Get more details on how a lack of sleep can cause weight gain, which supplements may improve sleep and how diet and food choices can help or harm sleep by accessing the FNCE® 2019 session recording, “137. Best of the Rest: Improving Health Through Better Sleep,” via eatrightSTORE.org and eatrightCPE.org.