



Insomnia, lack of sleep linked to high blood pressure in teens

Research Highlights:

- Teenagers who slept less than 7.7 hours in a sleep lab were observed to be almost three times more likely to have elevated blood pressure than well-rested peers.
- Those who reported insomnia and slept less than 7.7 hours in a sleep lab were five times more likely to have stage 2 hypertension when compared with well-rested peers.
- The study did not find a notable link between elevated blood pressure or stage 2 hypertension risk among adolescents who reported insomnia but slept 7.7 hours or more.
- *Note: The study featured in this news release is a research abstract. Abstracts presented at the American Heart Association's scientific meetings are not peer-reviewed, and the findings are considered preliminary until published as full manuscripts in a peer-reviewed scientific journal.*

Embargoed until 3 p.m. CT/4 p.m. ET, Thursday March 6, 2025

NEW ORLEANS, March 6, 2025 — Teenagers who do not get the recommended amount of sleep may be at an increased risk for high blood pressure, according to preliminary research presented at the American Heart Association's [Epidemiology, Prevention, Lifestyle & Cardiometabolic Health Scientific Sessions 2025](#). The meeting will be held in New Orleans, March 6-9, 2025, and features the latest science on population-based health and wellness and implications for lifestyle.

Poor sleep is a known [risk factor](#) for cardiovascular disease, which claims more lives each year in the U.S. than all forms of cancer and chronic lower respiratory disease combined, according to the American Heart Association's [2025 Statistical Update](#). Teenagers need 8 to 10 hours of sleep each night, according to [the American Academy of Sleep Medicine](#), yet the average high school student is estimated to sleep only 6.5 hours per weeknight.

Researchers studied a diverse group of more than 400 teenagers from the Penn State Child Cohort. Participants in the study self-reported insomnia on a questionnaire prior to enrolling in the lab-based sleep study. In the nine-hour overnight sleep study, called a polysomnography, sensors were attached to each participant's head, face and body to measure their sleep duration objectively. The study also included three consecutive blood pressure measurements taken on the night of the sleep study about two-to-three hours before lights were turned off in the lab.

"We know that disturbed and insufficient sleep is associated with high blood pressure in adults, particularly in adults who report insomnia and sleep objectively less than six hours, but we do not yet know if these associations exist in adolescents," said senior study author Julio Fernandez-Mendoza, Ph.D., a professor of psychiatry, neuroscience and public health sciences and director of behavioral sleep medicine at Pennsylvania State University College of Medicine in Hershey, Pennsylvania.

The researchers defined insomnia as reporting difficulty falling and/or staying asleep and defined objective short sleep duration as less than 7.7 hours, based on the median total time asleep in the lab-based sleep study. Teenagers in the study were considered to have elevated blood pressure if they had a systolic, or top number, measurement of 120 mm Hg or higher and a diastolic, or bottom number, measurement of 80 mm Hg or lower. They were considered to have stage 2 hypertension if they had an average systolic blood pressure measurement

of 140 mm Hg or higher and/or an average diastolic measure of 90 mm Hg or higher, which aligns with the Association's 2017 [Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults](#).

The researchers found:

- Teenagers who self-reported insomnia and slept less than 7.7 hours in the lab were five times more likely to have clinical hypertension than “good sleepers” (participants who did not report insomnia and obtained sufficient sleep in the lab, defined as 7.7 hours or more).
- Teenagers who slept less than 7.7 hours in the lab but did not report insomnia had nearly three times the risk of elevated blood pressure compared to the good sleepers.
- Teens who self-reported insomnia but obtained sufficient sleep in the lab did not appear to be at higher risk for elevated blood pressure or stage 2 hypertension.

These findings suggest the combination of insomnia and inadequate hours of sleep likely contributes to more severe conditions than lack of sleep alone, the researchers noted.

“While we need to explore this association in larger studies on teens, it is safe to say that sleep health matters for heart health, and we should not wait until adulthood to address it,” Fernandez-Mendoza said. “Not all teens who complain of insomnia symptoms are at risk for cardiovascular issues, however, monitoring their sleep duration objectively can help us identify those who have a more severe form of insomnia and are at-risk for heart problems.”

Improving one's sleep health is something everyone can do to improve their cardiovascular health and is a key component of the Association's [Life's Essential 8](#). The key components of Life's Essential 8 include eating healthy food, being physically active, not smoking, getting enough sleep, maintaining a healthy weight and controlling cholesterol, blood sugar and blood pressure levels.

“Our findings are important because they call attention to the need to listen to teens who complain of disturbed sleep, to monitor and assess their sleep objectively and help them improve it in order to prevent heart problems early,” said the study's first author Axel Robinson, a 17-year-old senior at Pelham Memorial High School in Pelham, New York.

Robinson, whose high school offers a four-year science research program, read one of Fernandez-Mendoza's scientific articles when he was in ninth grade and reached out to Fernandez-Mendoza, asking him to become his research mentor. “I have always been personally interested in insomnia, so I pursued two internships with Dr. Fernandez-Mendoza with the goal of learning more about the disorder. Insomnia had bothered me my entire life and I was able to overcome it thanks to what I learned and a therapist he recommended,” he said.

Study details, background and design:

- The study group included 421 participants (54% boys and 46% girls, average age 16.5 years) from three school districts in the Harrisburg, Pennsylvania, metropolitan area. 77% of participants self-identified as white; 13% self-identified as Black; 7% self-identified as Hispanic; and 3% selected “Other.”
- The overnight sleep study and blood pressure measurements occurred between 2010 and 2013, and data analyses were conducted between 2023 and 2024.
- Of the participants, 35% reported difficulty falling and/or staying asleep (insomnia symptoms) and 50% slept less than 7.7 hours in the lab (objective short sleep duration).
- Data was collected between 2010 and 2013 through self-reported questionnaires, a polysomnography (a sleep study conducted in a lab) and seated blood pressure measurements collected in the lab the same evening of the sleep studies.
- The Penn State Child Cohort is ongoing and collecting data from the same participants, now ages 20 to 33 years old.

The study's limitations include that it was conducted in a sleep lab, so participants might not have slept as well as if they were at home. Additionally, because all data collection took place between 2010 and 2013, “It is uncertain whether there may be post-COVID increases in adolescent insomnia, depression and anxiety that could impact the results of other studies when replicated now,” Fernandez-Mendoza noted.

"This study adds to the limited knowledge base about the relation between poor sleep and risk of hypertension during a crucial life stage of development," said Brooke Aggarwal, Ed.D., M.S., FAHA, an assistant professor of medical sciences in the department of medicine's division of cardiology at Columbia University Medical Center and a member of the Association's Lifestyle Sleep Health Science Committee.

"Prevention of heart disease is key, and it begins with the adoption of a healthy lifestyle in childhood and adolescence, including optimal sleep. Setting healthy sleep patterns during the teenage years could carry over into adulthood. Similarly, sleep problems that occur during the teen years tend to persist over time and could predispose individuals to increased cardiovascular risk later in life," said Aggarwal, who was not involved in the study.

"Besides treatment for any clinical sleep disorders, teens can also practice good sleep hygiene, including creating relaxing bedtime routines, limiting electronics use in the hours before bedtime, avoiding heavy meals before bed, restricting caffeine and participating in daily physical activity."

This year, daylight saving time begins on Sunday, March 9. Daylight saving time is the practice of setting the clocks an hour ahead of standard time to achieve longer evening daylight in the summer months. Following good sleep hygiene, as well as getting as much natural light as possible each day and winding down earlier in the evenings ahead, can help to get ahead of the time change.

"Many people, including teens, struggle to adjust and their sleep suffers. Before we all spring ahead, I'd encourage parents and teens to talk about the importance of sleep and make a plan to adjust schedules to ensure everyone gets adequate sleep," Aggarwal said.

Moderated Poster Presentation MP13 in Session MP02 Sleep Behavior and Sleep Disorders is Thursday, March 6, 2025 at 5:00 p.m. CT.

Co-authors, their disclosures and funding sources are listed in the abstract.

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The Association receives funding primarily from individuals; foundations and corporations (including pharmaceutical, device manufacturers and other companies) also make donations and fund specific Association programs and events. The Association has strict policies to prevent these relationships from influencing the science content. Revenues from pharmaceutical and biotech companies, device manufacturers and health insurance providers and the Association's overall financial information are [here](#).

Additional Resources:

- Multimedia is available on the right column of the [release link](#).
- After March 6, 2025, view the [abstract MP13](#) on the ePoster site for Epidemiology, Prevention, Lifestyle & Cardiometabolic Scientific Sessions 2025.
- AHA news release: [A good night's sleep may make it easier to stick to exercise and diet goals, study found](#) (March 2023)
- AHA news release: [American Heart Association adds sleep to cardiovascular health checklist](#) (June 2022)
- AHA resources: [How Sleep Affects Your Health](#)
- AHA resources: [How to Sleep Better with a Bedtime Routine](#)
- AHA resources: [Life's Essential 8 - How to Get Healthy Sleep Fact Sheet](#)
- For more news from AHA EPI Lifestyle Scientific Sessions 2025, follow us on X [@HeartNews](#), #EPIlifestyle25.

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The American Heart Association's EPI | Lifestyle Scientific Sessions 2025 is the world's premier meeting dedicated to the latest advances in population-based science. The meeting is **Thursday through Sunday, March 6-9, 2025, at the Hyatt Regency in New Orleans**. The primary goal of the meeting is to promote the development and application of translational and population science to prevent heart disease and stroke and foster cardiovascular health. The sessions focus on risk factors, obesity, nutrition, physical activity, genetics, metabolism, biomarkers, subclinical disease, clinical disease, healthy populations, global health, and prevention-oriented clinical trials. The Councils on Epidemiology and Prevention and Lifestyle and Cardiometabolic Health (Lifestyle) jointly planned the EPI | Lifestyle Scientific Sessions 2025. Follow the conference on X at **#EPLifestyle25**.

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