

Poor teen sleep habits may raise blood pressure, lead to CVD

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Teenagers who don't sleep well or long enough may have a higher risk of elevated blood pressure that could lead to cardiovascular disease later in life, researchers report in *Circulation: Journal of the American Heart Association*.

Researchers found the odds of elevated blood pressure increased 3.5 times for those with low sleep efficiency and 2.5 times for those with sleeping periods of less than 6.5 hours, even after adjusting for gender, body mass index and socioeconomic status.

Adolescents with low sleep efficiency — those who have trouble falling to sleep at night or who wake up too early — had an average 4 millimeters of mercury (mm Hg) higher systolic blood pressure compared to children with higher sleep efficiency.

The study of 238 (123 boys and 115 girls) 13-to 16-year-olds is the first to examine insufficient sleep and blood pressure in healthy adolescents.

"Our study underscores the high rate of poor quality and inadequate sleep in adolescence coupled with the risk of developing high blood pressure and other health problems," said Susan Redline, M.D., M.P.H., senior author of the study and professor of medicine and pediatrics and director of University Hospitals Sleep Center at Case Western Reserve University in Cleveland, Ohio. "We also found that a low sleep efficiency may be more consistently associated with pre-hypertension than a shorter sleep period."

Researchers discovered that 14 percent of the adolescents had pre-hypertension or hypertension with blood pressures in the 90th percentile for their height, age and gender. Twenty-six percent of the participants had low sleep efficiency and 11 percent had an extremely short sleep duration of less than 6.5 hrs.

Nearly two-thirds of the adolescents with short sleep duration also had low sleep efficiency, while 27.9 percent of adolescents with low sleep efficiency also had short sleep duration.

Researchers measured participants' wrist movements at home for five to seven days and participants completed a daily sleep log to provide estimates of sleep patterns. Researchers also measured sleep quality in a sleep laboratory and took nine blood pressure readings in a two-day period.

Participants with less than 85 percent sleep efficiency in the lab had nearly three times the odds of elevated high blood pressure.

"These associations may have a large public health impact," Redline said. "Although the overall frequency of sleep insufficiency in children is unknown, our study's prevalence of 26 percent may be underestimated due to the exclusion of children with known sleep disorders and other illnesses."

Hypertension has become an increasingly prevalent health problem in adults and adolescents. Childhood hypertension is associated with adult hypertension, a risk factor for cardiovascular disease, end-organ damage and left ventricular hypertrophy (an enlargement of the heart's main pumping chamber).

"Part of the problem is the technological invasion of the bedroom with computers, cell phones and music," Redline said. "There are teens who

text message or listen to music all night, compounded by early school hours. Adolescents need nine hours of sleep. Parents should optimize sleep quality for their family with regular sleep and wake times and bedrooms should be kept quiet, dark and conducive to sleep."

Researchers also found an increased prevalence of low sleep efficiency among the more "vulnerable population" such as poorer children and minorities. "These groups already are known to be at higher risk for hypertension and other adverse outcomes," Redline said. "Their high prevalence of poor sleep quality and deprivation could be due to disruptive home environments and neighborhoods, as well as unrecognized psychological and medical problems."

Redline said further research is needed to determine whether prevention of hypertension in children should not only include weight management and exercise, but optimization of sleep.

"Meanwhile, pediatricians should view sleep quality and patterns as an intervenable health concern," she said. "Our data underscores the need to monitor quality and quantity of sleep as part of a child's overall health strategy."

Source: American Heart Association

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