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Study: Lack of early light upsets teen sleep clock

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WASHINGTON -- Sit by the window in school? Lack of the right light each morning to reset the body's natural sleep clock might play a role in teenagers' out-of-whack sleep, a small but provocative school experiment suggests.

Specialists say too few teens get the recommended nine hours of shut-eye a night. They're often unable to fall asleep until late and struggle to awaken for early classes. Sleep patterns start changing in adolescence for numerous reasons, including hormonal changes and more school, work and social demands.

Researchers turned to a North Carolina school built for energy efficiency, with lots of skylights so classrooms could reduce use of electric lights yet still be brighter than usual indoors. That allowed testing of the effects when some eighth-graders at Smith Middle School in Chapel Hill suddenly lost exposure to a specific wavelength of light.

From waking until school ended, 11 students donned special orange goggles that block short-wavelength "blue light," but not other wavelengths necessary for proper vision. Blocking that light for five days upset the students' internal body clocks - delaying by half an hour their evening surge of a hormone called melatonin that helps induce sleep, Rensselaer Polytechnic Institute researchers reported Tuesday.

Teens who trudge to the bus stop before dawn or spend their days in mostly windowless schools probably suffer the same effect, as daylight is the best source of those short-wavelength rays, said lead researcher Mariana Figueiro of Rensselaer's Lighting Research Center in Troy, N.Y.

"If you have this morning light, that is a benefit to the teenagers," Figueiro said.

Figueiro's study was a first step to test in real-world conditions findings from sleep laboratories showing that light effects on the 24-hour body clock may play a role in teen sleep problems too.

The study, published in the journal *Neuroendocrinology Letters*, is small and didn't track student sleep, just an early sign of change, the evening melatonin surge that typically precedes sleep by about two hours.

But while preliminary, the study is well done and should spur additional research on everyday light exposure, said Dr. Judith Owens, an associate pediatrics professor at Brown University and sleep medicine specialist.

"There's a biologically based shift in the natural sleep onset and wake-up time. I think what this study shows is that you can impact that shift with light manipulation," Owens said. "The major take-home

message is to get natural light exposure early in the day."

Morning light isn't the only factor, added Figueiro. Tuesday's report is part of a larger study involving a second school in New York to examine evening light exposure - computer and TV light plus regular indoor lighting. Too much evening light can add to the problem, she said.

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