

# Body weight, sleep-disordered breathing and cognition linked in children

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Researchers at the University of Chicago have found important new relationships between obesity, sleep-disordered breathing (SDB) and cognitive processing among elementary school children.

"The intricate interdependencies between BMI, SDB and cognition shown in our study are of particular importance in children, as their brains are still rapidly developing," says study author Karen Spruyt, PhD, assistant professor in the Department of Pediatrics at the Pritzker School of Medicine. "Rising rates of obesity in children may amplify these relationships. Public health campaigns targeting obesity should emphasize not only the health benefits but the potential educational benefits of losing weight."

The findings were published online ahead of print publication in the *American Thoracic Society's American Journal of Respiratory and Critical Care Medicine*.

According to Dr. Spruyt, "SDB amplified the risk of adverse [cognitive](#) and weight outcomes, while weight amplified the risk of SDB and adverse cognitive outcomes. Impaired cognitive functioning was associated with an increased risk of adverse weight outcomes and SDB."

In contrast, she noted, "good cognitive abilities may be protective against increased body weight and SDB."

The study enrolled 351 schoolchildren (mean age 7.9 years) in

Louisville, Kentucky, who underwent neurocognitive testing with the Differential Abilities Scale following an overnight polysomnogram or sleep study. SDB was measured with the obstructive apnea/hypopnea index (AHI), defined as the number of apnea and hypopneas per hour of total [sleep time](#). Anthropometric measurements included [body mass index](#) (BMI). Data were analyzed by Structural Equation Modeling, a [statistical technique](#) for testing and estimating causal relations between the variables of interest.

Models using "sleep-disordered breathing" revealed a substantive mediator role of SDB on the relationship between BMI and cognitive performance, with SDB increasing both adverse cognitive and adverse weight outcomes. In analyses using "weight," BMI increased the risks of adverse SDB and [cognitive outcomes](#). Finally, in models using "cognition" as the mediator, the poor ability to perform complex mental processing functions was shown to increase the risk of adverse weight and SDB outcomes.

"The mediator roles of weight and SDB were comparable, both adversely affecting cognitive functioning." Dr. Spruyt noted. "Poorer integrative mental processing may also increase the risk of adverse health outcomes."

The study had some limitations. The study included only normally developing children, limiting generalization of the results to more impaired populations. The authors also note that inclusion of children with more severe SDB might have altered the magnitude of the mediation effects.

"Along with campaigns targeting childhood obesity," Dr. Spruyt adds, "screening for SDB in overweight children and children with learning difficulties may be justified based on our results."

Provided by American Thoracic Society

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