

# Loud snoring and insomnia symptoms predict the development of the metabolic syndrome

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A study in the Dec. 1 issue of the journal *Sleep* found that loud snoring and two common insomnia symptoms - difficulty falling asleep and unrefreshing sleep - each significantly predicted the development of the metabolic syndrome. The study emphasizes the importance of screening for common sleep complaints in routine clinical practice.

Results of multivariate logistic regression models show that the risk of developing the metabolic syndrome over a three-year follow-up period was more than two times higher in adults who reported frequent loud snoring (odds ratio = 2.30). This risk also was increased by 80 percent in adults who reported having difficulty falling asleep (OR = 1.81) and by 70 percent in those who reported that their sleep was unrefreshing (OR = 1.71).

Further analysis found that unrefreshing sleep was reduced to marginal significance with additional adjustment for loud snoring. However, when simultaneously entered in a statistical model, both loud snoring and difficulty falling asleep remained significant independent predictors of the metabolic syndrome.

"This is the first prospective study to show that a broader array of commonly reported sleep symptoms, including insomnia and sleep-disordered breathing symptoms, predict the development of the metabolic syndrome, a key risk factor for [cardiovascular disease](#)," said

lead author Wendy M. Troxel, PhD, assistant professor of psychiatry and psychology at the University of Pittsburgh in Pittsburgh, Pa. "It was rather striking that the effects of difficulty falling asleep and loud snoring were largely independent of one another."

According to the National Heart, Lung, and Blood Institute, metabolic syndrome is a group of obesity-related [risk factors](#) that increases an individual's risk of [heart disease](#), diabetes and stroke. A person with at least three of these five risk factors is considered to have metabolic syndrome: excess abdominal fat, high triglycerides, low HDL cholesterol, [high blood pressure](#) and high blood sugar.

Analyses of these five individual components of the metabolic syndrome revealed that loud snoring significantly predicted the development of high blood sugar (OR = 2.15) and low HDL cholesterol (1.92). Difficulty falling asleep and unrefreshing sleep did not predict any of the individual metabolic abnormalities.

Only loud snoring continued to predict the development of the metabolic syndrome after accounting for the number of metabolic abnormalities present at baseline. According to the authors, this suggests that loud snoring may be a causal risk factor cardiometabolic dysregulation.

The study involved 812 participants in Heart SCORE, an ongoing, community-based, prospective study of adults between 45 and 74 years of age. People who were classified as having the metabolic syndrome or diabetes at baseline were excluded from the study. During the three-year follow-up period, 14 percent of participants developed the metabolic syndrome.

Self-reported sleep disturbances were assessed using the Insomnia Symptom Questionnaire and the Multivariable Apnea Prediction Questionnaire. The development of the metabolic syndrome was

unrelated to difficulty staying asleep and frequent awakening from sleep, which are two other insomnia symptoms that are commonly reported.

Apnea-hypopnea index (AHI), an average of the combined episodes of partial reductions (hypopneas) and complete pauses (apneas) in breathing per hour of sleep, was calculated in a subset of 290 participants who wore a portable monitor that measured nasal airflow. In an analysis of this subset, loud [snoring](#) remained an independent predictor of the development of the [metabolic syndrome](#) (OR = 3.01) even after adjusting for AHI, while difficulty falling asleep was reduced to marginal statistical significance.

**More information:** More information about snoring is available from the American Academy of Sleep Medicine at [www.sleepeducation.com/Disorder.aspx?id=26](http://www.sleepeducation.com/Disorder.aspx?id=26)

Provided by American Academy of Sleep Medicine

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