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Sleep problems put individuals at risk of respiratory infections, suggests large study

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A study based on more than 600,000 participants suggests that insomnia

increases the risk of influenza and other respiratory infections. Sleep problems also increased the risk of COVID-19 infection requiring hospitalization.

The study, led by researchers at the University of Helsinki, shows that a previous diagnosis of insomnia increases the risk of developing respiratory infections. In total, the study covered more than 600,000 individuals from Finland (the FinnGen study) and United Kingdom (the UK Biobank).

Among the Finnish individuals with diagnosis of insomnia, the risk of developing an unspecified respiratory infection was almost six times higher and the risk of influenza more than four times higher, compared to the other participants. Analyses based on the UK biobank data supported the association between insomnia diagnosis and risk of respiratory infections.

Genetic analysis suggests a causal relationship

Previous studies have suggested an association between short-term insomnia or sleep deprivation and immune system and defense against pathogens. The link between chronic insomnia and susceptibility to infection has also been investigated, but large-scale population studies have rarely been done and the large number of genetic instruments needed for testing causality have only recently become available.

The current study used methods of genetic epidemiology to examine a possible causal link between insomnia and infections. This study found that insomnia increases the risk of respiratory infections. Furthermore, these findings highlighted an association between insomnia and the severity of COVID-19 symptoms as well as COVID-19 infection requiring hospitalization.

"The advantage of this kind of study design is that it makes use of longitudinal data. In addition, the genetic analysis allows for the identification of causal relationships between two traits. In this particular study we test causality leveraging genetic analysis tools that use randomization to estimate causality," says Dr. Hanna Ollila from the Institute for Molecular Medicine Finland (FIMM) at the University of Helsinki, who led the study.

The researchers were also able to demonstrate that the results are not explained by factors such as obesity or smoking, both of which are known to predispose to both insomnia and respiratory infections.

Approximately 30% of adults suffer from insomnia according to the American Academy of Sleep Medicine. Therefore, the findings also have public health implications.

"Our results are in line with earlier literature and show that getting enough sleep is important for maintaining an effective immune defense," Hanna Ollila concludes.

The study was carried out by the University of Helsinki and Harvard Medical School in collaboration with Yale and Stanford Universities.

The article, published in *eBioMedicine*, is open access.

More information: Samuel E. Jones et al, The public health impact of poor sleep on severe COVID-19, influenza and upper respiratory infections, *eBioMedicine* (2023). DOI: 10.1016/j.ebiom.2023.104630

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