

Insomnia identified as a new risk factor for type 2 diabetes in new study

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A new 'global atlas' study published in *Diabetologia* is the first to identify insomnia as a risk factor associated with increased risk of developing type 2 diabetes (T2D). The study identifies 34 risk factors that are

thought to increase (19) or decrease risk (15), as well as a further 21 'suggestive' risk factors where evidence was not quite as strong.

The study by Associate Professor Susanna Larsson and by Shuai Yuan of the Karolinska Institutet, Stockholm, Sweden, used a technique called 'Mendelian Randomisation' (MR), which uses genetic variation as a natural experiment to investigate the causal relations between potentially [modifiable risk factors](#) and [health outcomes](#) in observational data. MR is less likely to be affected by confounding or reverse causation than observational studies.

To identify possible risk factors for T2D, the authors conducted a review of meta-analyses and review articles in the PubMed database and found 1,360 relevant articles. They found a total of 97 risk factors that could be investigated using the MR method. For the study population, they used summary-level data from the DIAbetes Genetics Replication And Meta-analysis consortium (74,124 type 2 [diabetes](#) cases and 824,006 controls of European ancestry). The team then checked that these potential causal associations could be replicated in a separate independent population, using the FinnGen consortium (11,006 type 2 diabetes cases and 82,655 controls of European ancestry).

They found evidence of causal associations between 34 exposures (19 risk factors and 15 protective factors) and T2D. Insomnia was identified as a novel risk factor, with people with insomnia being 17% more likely to develop T2D than those without.

The other 18 risk factors for T2D were depression, [systolic blood pressure](#), starting smoking, lifetime smoking, coffee (caffeine) consumption, blood plasma levels of the [amino acids](#) isoleucine, valine and leucine, liver enzyme alanine aminotransferase (a sign of liver function), childhood and adulthood body mass index (BMI), body fat percentage, visceral (internal) fat mass, resting [heart rate](#), and blood

plasma levels of four [fatty acids](#).

The 15 exposures associated with a decreased risk of type 2 diabetes were plasma alanine (an amino acid), high density lipoprotein (good cholesterol) and total cholesterol, age at beginning puberty in women (menarche), [testosterone levels](#), sex hormone binding globulin levels (adjusted for BMI), birthweight, adulthood height, lean body mass (for women), four plasma fatty acids, circulating vitamin D and years of education.

After adjusting for adulthood BMI, 8 risk factors remained statistically significantly associated with T2D risk, suggesting they are independent of body weight (see figure 2 full paper). Insomnia remained as one of these factors, however the increased risk for those with insomnia compared to those without fell from 17% to 7% after adjustment for BMI, indicating that part of the effect of insomnia on T2D risk is mediated by BMI. Systolic blood pressure, lifetime smoking and levels of liver enzyme remained as risk factors (positively associated with T2D). Increasing total cholesterol, [good cholesterol](#), testosterone levels and sex hormone levels remained as protective factors (inversely associated with T2D) after adjustment.

Among the further 21 'suggestive' causal factors for type 2 diabetes (where the evidence was weaker than for the other factors above) were alcohol consumption, breakfast skipping, daytime napping, short sleep, urinary sodium (salt) levels, and certain amino acids and inflammatory factors.

The authors conclude: "Our study confirmed several previously established risk factors and identified novel potential [risk factors](#) for type 2 diabetes using the latest summary-level data. Findings should inform public health policies for the primary prevention of type 2 diabetes. Prevention strategies should be constructed from multiple

perspectives, such as lowering obesity and smoking rates and levels, and improving mental health, sleep quality, educational level and birthweight."

More information: Shuai Yuan et al. An atlas on risk factors for type 2 diabetes: a wide-angled Mendelian randomisation study, *Diabetologia* (2020). DOI: [10.1007/s00125-020-05253-x](https://doi.org/10.1007/s00125-020-05253-x)

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