

'Night owls' more likely than 'early birds' to develop diabetes, finds study

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Investigators found evening "chronotype," or going to bed late and waking up late, was associated with a 19% increased risk of diabetes after accounting for lifestyle factors

A new study has an important message for people who consider themselves night owls. Investigators from Brigham and Women's Hospital, a founding member of the Mass General Brigham health care system, found that people with later sleep and wake times had less [healthy lifestyles](#) and were at greater risk of developing [diabetes](#) than those with early-bird sleep habits. Their results are published in the [*Annals of Internal Medicine*](#).

"Chronotype, or circadian preference, refers to a person's preferred timing of sleep and waking and is partly genetically determined so it may be difficult to change," said corresponding author Tianyi Huang, MSc, ScD, an associate epidemiologist in the Brigham's Channing Division of Network Medicine. "People who think they are 'night owls' may need to pay more attention to their [lifestyle](#) because their evening chronotype may add increased risk for type 2 diabetes."

The researchers previously found that people with more irregular sleep schedules are at higher risk of developing diabetes and [cardiovascular disease](#) and that people with evening chronotypes are more likely to have irregular sleep patterns. For this study, they wanted to understand the relationship between chronotype and diabetes risk and looked at the role of lifestyle factors as well.

The team analyzed data from 63,676 female nurses from the Nurses' Health Study II collected from 2009-2017 and included self-reported chronotype (the extent to which participants perceived themselves to be an evening person or a morning person), diet quality, weight and body mass index, sleep timing, smoking behaviors, alcohol use, physical activity, and family history of diabetes. The team determined diabetes status from the participants' self-reports and medical records.

The Nurses' Health Study II, a joint effort between the Brigham's Channing Division of Network Medicine and Harvard T.H. Chan School

of Public Health, is among the largest investigations into risk factors for major chronic diseases in women. One of the study's strengths is its regular follow-up of study participants and repeated assessment of health and lifestyle factors.

Approximately 11% of participants reported having a "definite evening" chronotype and about 35% reported having "definite morning" chronotype. The remaining population, around half, were labeled as "intermediate," meaning they either identified as being neither a morning nor evening type or as being only slightly more one than the other.

The evening chronotype was associated with a 72% increased risk for diabetes before accounting for lifestyle factors. After accounting for lifestyle factors, evening chronotype was associated with a 19% increased risk of diabetes. Among those in the study with the healthiest lifestyles, only 6% had evening chronotypes. Among those with the unhealthiest lifestyles 25% were evening chronotypes.

Those with evening chronotypes were found to be more likely to drink alcohol in higher quantities, have a low-quality food diet, get less hours of sleep per night, currently smoke, and have weight, BMI, and [physical activity](#) rates in the unhealthy range.

"When we controlled for unhealthy lifestyle behaviors, the strong association between chronotype and diabetes risk was reduced but still remained, which means that [lifestyle factors](#) explain a notable proportion of this association," said first author Sina Kianersi, DVM, Ph.D., a postdoctoral research fellow in the Brigham's Channing Division of Network Medicine.

They also found the association between evening chronotype and diabetes risk only in those nurses who worked day shifts and not those

who worked overnight shifts.

"When chronotype was not matched with [work hours](#) we saw an increase in type 2 diabetes risk," said Huang. "That was another very interesting finding suggesting that more personalized work scheduling could be beneficial."

The Nurses' Health Study is comprised mainly of white female nurses—future investigations will be needed to determine if the patterns detected here are consistent across populations. The study's results point to associations but cannot determine causality—it's possible that other factors may contribute to a person's chronotype, propensity for unhealthy habits and risk of diabetes.

Next, the researchers plan to investigate genetic determinants of chronotype and its association with cardiovascular disease, in addition to diabetes, in larger, more diverse populations.

"If we are able to determine a causal link between chronotype and diabetes or other diseases, physicians could better tailor prevention strategies for their patients," says Kianersi.

More information: Chronotype, unhealthy lifestyle, and diabetes risk in middle-aged U.S. women: a prospective cohort study in the Nurses' Health Study II., *Annals of Internal Medicine* (2023). [DOI: 10.7326/M23-0728](#). www.acpjournals.org/doi/10.7326/M23-0728

Provided by Brigham and Women's Hospital

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