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Night owls are more likely to develop type 2 diabetes, finds study

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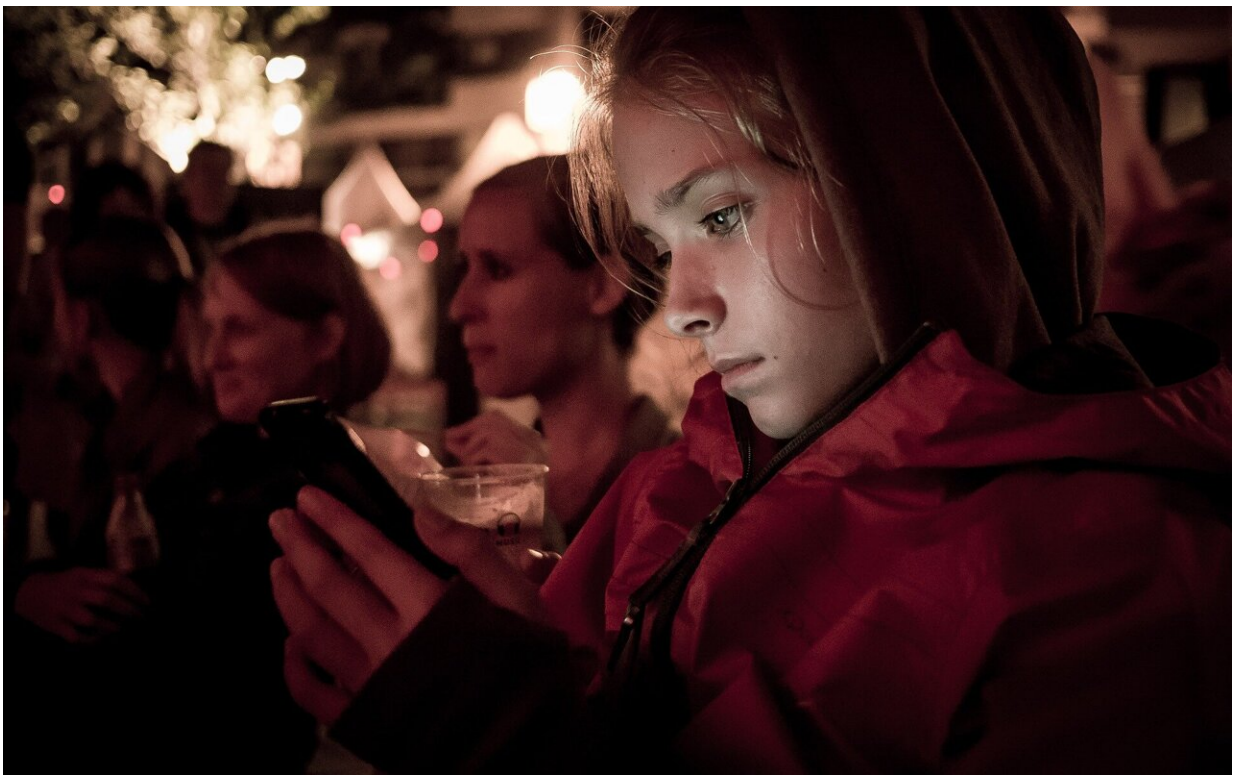

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Night owls have a higher BMI, larger waists, more hidden body fat and are almost 50% more likely to develop type 2 diabetes (T2D) than those who go to bed earlier, shows new research to be presented at the Annual Meeting of the European Association for the Study of Diabetes (EASD)

in Madrid, Spain (9-13 September).

Lead researcher Dr. Jeroen van der Velde, of Leiden University Medical Centre, Leiden, Netherlands, says, "Previous studies have indicated that a late chronotype—preferring to go to bed late and wake up later—is associated with an unhealthy lifestyle. Late chronotypes are more likely to smoke or have an unhealthy diet, for example, and it has been suggested this is why they are at higher risk of obesity and metabolic disorders including type 2 diabetes.

"However, we believe that lifestyle cannot fully explain the relationship between a late chronotype and metabolic disorders. In addition, while it is known that a late chronotype is associated with high BMI, it isn't clear to what extent chronotype affects body fat distribution."

To find out more, Dr. van der Velde and colleagues studied the association between sleep timing, T2D and body fat distribution in more than 5,000 individuals, as part of the Netherlands Epidemiology of Obesity study, an ongoing study into the influence of body fat on disease.

The analysis involved participants (54% female) with a mean age of 56 years and mean BMI of 30 kg/m^2. Participants filled in a questionnaire with their typical bed and waking times, and from this midpoint of sleep (MPS) was calculated.

The participants were then divided into three groups: early chronotype (the 20% of participants with the earliest MPS), late chronotype (the 20% of participants with the latest MPS) and intermediate chronotype (the remaining 60% of participants).

BMI and waist circumference were measured in all participants. Visceral fat and liver fat were measured in 1,526 participants, using MRI scans

and MR spectroscopy, respectively.

The participants were followed-up for a median of 6.6 years, during which 225 were diagnosed with T2D.

The results, which were adjusted for age, sex, education, total body fat and a range of lifestyle factors (physical activity, diet quality, alcohol intake, smoking and sleep quality and duration), showed that compared with an intermediate chronotype, participants with a late chronotype had a 46% higher risk of T2D.

This suggests that the increased risk of T2D in late chronotypes can't be explained by lifestyle alone.

"We believe that other mechanisms are also at play," says Dr. van der Velde. "A likely explanation is that the circadian rhythm or body clock in late chronotypes is out of sync with the work and social schedules followed by society. This can lead to circadian misalignment, which we know can lead to metabolic disturbances and ultimately type 2 diabetes."

The team also looked at T2D risk in early chronotypes.

"From the literature, we expected early chronotypes to have a similar risk of developing type 2 diabetes as intermediate chronotypes," says Dr. van der Velde. "Our results showed a slightly higher risk but this was not statistically significant."

The results also showed that late chronotypes had a 0.7 kg/m^2 higher BMI, 1.9 cm larger waist circumference, 7 cm^2 more visceral fat and 14% higher liver fat content, compared with those with an intermediate chronotype.

Dr. van der Velde concludes, "People with a late chronotype appear to

be at greater risk of developing type 2 diabetes compared to those with an intermediate chronotype, possibly because of higher body fat including more visceral fat and liver fat.

"The next step is to study if those with a late chronotype improve in metabolic health when they make changes in the timing of their lifestyle habits. We are currently involved in the TIMED consortium, where the complex interplay of the timing of sleep, food intake and physical activity in relation to type 2 diabetes is examined. We previously showed that timing of physical activity is important in relation to insulin resistance."

Another example would be to alter the timing of meals.

"People with a late chronotype are probably more likely to eat until later in the evening," says Dr. van der Velde. "While we did not measure this in our study, there is growing evidence that time-restricted eating, not eating anything after a certain time, such as 6 pm, may lead to metabolic benefits.

"Night owls who are concerned about the increased risk of type 2 diabetes might want to try this or, at least, try to refrain from eating late in the evening. The evidence isn't there yet, but in time, we aim to provide specific advice regarding the timing of lifestyle behavior."

Provided by Diabetologia

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