

# Study finds link between too much or too little sleep and increased death rates in patients with or without diabetes

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New research published in *Diabetologia* (the journal of the European Association for the Study of Diabetes [EASD]) reveals that too much or too little sleep in people with type 2 diabetes (T2D) is linked to sharply increased death rates, with the effect much larger than that found in the non-diabetic population. The study, based on data from the USA, is by Dr. Chuanhua Yu, School of Health Sciences, Wuhan University, Wuhan, Hubei, China, and Dr. Xiong Chen, Department of Endocrinology, The First Affiliated Hospital of Wenzhou Medical University, Wenzhou, Zhejiang, China, and colleagues.

While previous research has shown that extreme (too much or too little) sleep duration is linked to increased mortality in the general population, in this new study the authors wanted to examine how the presence of [diabetes](#) affected this association.

The authors used data from 273,029 adults including 248,817 without diabetes and 24,212 with T2DM who participated in the US National Health Interview Survey from 2004 to 2013, and had linked mortality data up to the end of 2015. Sleep duration was measured using self-reporting, with participants asked "on average how long do you sleep each day" (5 hours or less, 6, 7, 8, 9, and 10 or more hours/day). The relationship between sleep duration and mortality were investigated using computer modelling with adjustments for demographics, body mass index, lifestyle behaviours and clinical variables.

As expected, regardless of the amount of sleep compared, death rates were higher in people with T2D than those without (see table 2, full paper). The mortality rate for people with T2D with the 'ideal' level of 7 hours sleep was 138 per 10,000 person years, compared to 215 for less than 5 hours sleep and 364 for those with 10 hours of sleep or more. After adjustment of the data, the authors used people without diabetes who slept 7 hours as the reference or comparison group. Compared to this group, people with T2D who slept 7 hours had a 42% increased risk of death; for those with T2D and 10 or more hours sleep there was 2.2 times increased risk, while for those with T2D and 5 hours or less sleep there was a 63% increased risk of death.

A similar pattern, though less pronounced, was seen in the group without T2D. For those with the ideal 7 hours sleep, the death rate was 78 per 10000 person years, compared with 122 for 5 hours or less and 256 for 10 hours or more. Too much or too [little sleep](#) did increase the death rate, but not as much as in the group with T2D. Compared with those who slept 7 hours, those who slept 5 hours or less were at a 33% increased risk of death and those with 10 hours or more had an almost doubled (90%) increased risk of death.

Among people with T2D, there were also some links found between sleep duration and cause-specific mortality. For cancer mortality, people with five hours or less sleep per day, eight hours per day, and 10 hours or more per day had 41%, 26% and 59% greater risk of mortality, respectively compared with 7 hours per day (see table 3). The association between sleep duration and CVD mortality was only statistically significant for the longest sleep duration group (a 74% increased risk for 10 or more hours per day compared with 7 hours per day). The longest sleep groups (10 hours or more) also showed an increased risk of stroke mortality (3 times) and Alzheimer's disease (2.6 times) compared to 7 hours sleep.

The study also found that the shortest and longest sleep duration were associated greater risk of all-cause mortality relative to those sleeping 7 hours per day among people with T2DM diagnosed before the age of 45 years compared with those diagnosed after age 45 years. And the effect of extreme sleep duration on mortality was generally more pronounced in those who had had diabetes for more than 10 years compared with less than 10 years.

The authors point to previous research that shows insufficient sleep results in a 40% slower glucose clearance rate in the body, and activates the sympathetic (involuntary) part of the nervous system, which in turn can aggravate a person's status of insulin resistance, obesity, or high blood pressure. "Therefore, sleep deprivation in people with T2DM is likely to increase complications and affect the control and management of blood glucose which drive excess mortality risk," they say.

They add, however, that sleep is a complex phenomenon and extreme sleep duration may be a reflection of poorer health status and reduced functioning. For example, the finding that people with T2DM who sleep longer have an increased mortality risk may be linked to the possibility that these individuals experience greater diabetes-related complications that require more rest or long-term bed rest. Another possible explanation of these findings is that longer sleep duration has been associated with chronic inflammatory responses which increase mortality risk.

They say: "For people with T2DM, as per the general population, 6 to 8 hours of sleep is recommended on account of reducing mortality risk. Sleep interventions as an addition to standard diabetes treatment may warrant further attention."

They conclude: "This study provides preliminary evidence that the associations between [sleep duration](#) and mortality are different between

people with and without diabetes. Patients with diabetes sleeping for less than or in excess of 7 hours had an increased risk of all-cause and cause-specific [mortality](#), while too much or too little sleep also increased absolute [death rates](#) in people without diabetes, but to a lesser extent. The association was more prominent in those with younger age at disease onset. These patients may require greater medical attention that targets sleep and lifestyle to reduce the risks of adverse health outcomes."

**More information:** Yafeng Wang et al. Association between sleep duration and mortality risk among adults with type 2 diabetes: a prospective cohort study, *Diabetologia* (2020). [DOI: 10.1007/s00125-020-05214-4](#)

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