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Study finds irregular sleep patterns may lead to increased risk of type 2 diabetes

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Getting consistent sleep could help stave off type 2 diabetes, new research suggests. A study led by investigators at Brigham and Women's Hospital, a founding member of the Mass General Brigham health care

system, analyzed sleep patterns over the course of seven nights and then followed participants for more than seven years.

The researchers discovered that irregular sleep durations were associated with increased risk of diabetes, with individuals with the greatest irregular patterns having a 34% higher diabetes risk than their counterparts. The findings, published in *Diabetes Care*, suggest the importance of regular sleep for diabetes prevention.

"Our study identified a modifiable lifestyle factor that can help lower the risk of developing type 2 diabetes," said lead author Sina Kianersi, Ph.D., a research fellow in the Channing Division of Network Medicine at Brigham and Women's Hospital. "Our findings underscore the importance of consistent sleep patterns as a strategy to reduce type 2 diabetes."

Type 2 diabetes affects close to half a billion people worldwide and is one of the top 10 leading causes of death and disability. The number of people with type 2 diabetes is expected to more than double to 1.3 billion by 2050. This dire situation highlights the need for innovative strategies for diabetes prevention.

The new study analyzed accelerometry data from more than 84,000 participants in the UK Biobank Study to investigate any possible association between sleep and type 2 diabetes. Participants were an average age of 62 years (57% female, 97% white) and were initially free of diabetes. They wore accelerometers—devices like watches that monitor movement—for seven nights. The participants were followed for approximately 7.5 years, tracking diabetes development mostly through medical records.

The study set out to investigate two key questions. First, to discover whether irregular sleep durations may promote diabetes development

through circadian disruption and sleep disturbances. Second, to explore whether this association varies across genetic predispositions to diabetes.

The investigators found that more irregular sleep duration was associated with higher diabetes risk after adjusting for a wide range of risk factors. This association was more pronounced in individuals with longer sleep duration and lower polygenic risk score for diabetes.

The data revealed that compared to participants with regular sleep patterns, those with irregular sleep (where day-to-day sleep duration varied by more than 60 minutes on average) had a 34% higher risk of developing diabetes. The risk decreased, yet persisted, even after accounting for lifestyle, co-morbidities, family history of diabetes, and obesity indicators.

There were some study limitations. Certain lifestyle information used in the research was collected up to five years before the accelerometer study began. This might have affected the accuracy of the results. Also, the assessment of sleep duration based on 7-days may not capture long-term sleep patterns. Lastly, study participants were mainly healthy, older, and white, and may not represent outcomes for more diverse populations.

The researchers plan to study participants from younger age groups and with diverse racial backgrounds. They are also interested in exploring the biological reasons for why sleep irregularity increases the risk of diabetes.

"Our findings have the potential to improve diabetes prevention on multiple levels," said Kianersi. "Clinically, they might inform better patient care and treatment plans. Public health guidelines could promote regular sleep patterns. However, more research is needed to fully understand the mechanism and confirm the results in other populations."

More information: Kianersi S et al. Association Between Accelerometer-Measured Irregular Sleep Duration and Type 2 Diabetes Risk: A Prospective Cohort Study in the UK Biobank.*Diabetes Care* (2024). DOI: 10.2337/dc24-0213

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