

Lack of Sleep Belly

Sleep deprivation sends fat to your belly

When we lose sleep, we often feel like our energy and alertness levels are the biggest problem. But what if there is something potentially more dangerous? What if chronic sleep loss is not only causing you to gain fat, but causing you to gain it in the most dangerous location? What are the dangers of gaining fat in this location? This study, from the Mayo Clinic, shows us how much of a problem chronic sleep deprivation could be for our metabolism.



Abstract

- Background: Although the consequences of sleep deficiency for obesity risk are increasingly apparent, experimental evidence is limited and there are no studies on body fat distribution.
- Objectives: The purpose of this study was to investigate the effects of experimentally-induced sleep curtailment in the setting of free access to food on energy intake, energy expenditure, and regional body composition.
- Methods: Twelve healthy, nonobese individuals (9 males, age range 19 to 39 years) completed a randomized, controlled, crossover, 21-day inpatient study comprising 4 days of acclimation, 14 days of experimental sleep restriction (4 hour sleep opportunity) or control sleep (9 hour sleep opportunity), and a 3-day recovery segment. Repeated measures of energy intake, energy expenditure, body weight, body composition, fat distribution and circulating biomarkers were acquired.
- Results: With sleep restriction vs control, participants consumed more calories ($P = 0.015$), increasing protein ($P = 0.050$) and fat intake ($P = 0.046$). Energy expenditure was unchanged (all $P > 0.16$). Participants gained significantly more weight when exposed to experimental sleep restriction than during control sleep ($P = 0.008$). While changes in total body fat did not differ between conditions ($P = 0.710$), total abdominal fat increased only during sleep restriction ($P = 0.011$), with significant increases evident in both subcutaneous and visceral abdominal fat depots ($P = 0.047$ and $P = 0.042$, respectively).
- Conclusions: Sleep restriction combined with ad libitum food promotes excess energy intake without varying energy expenditure. Weight gain and particularly central accumulation of fat indicate that sleep loss predisposes to abdominal visceral obesity. (Sleep Restriction and Obesity; NCT01580761)

This cross-over study of healthy, non-obese people looked at the contrast of 2 weeks of 4 hours of sleep per night with a second 2-week period of up to 9 hours of sleep. The researchers monitored caloric intake and used accelerometry to monitor energy expense. Although 2 weeks is a short time, the findings were remarkable. The sleep-deprived subjects ate on average an additional 308 calories a day. At the end of 2 weeks, the sleep-deprived group gained about a pound of body weight. While this is not a huge difference in overall weight, further analysis found that the 1 pound of weight gained was in the form of fat inside the belly. Should we lose sleep over increased belly (visceral) fat? The short answer is yes. Visceral fat is extremely harmful. It is metabolically active, promotes inflammation, and is linked to a higher risk of type 2 diabetes, insulin resistance, heart disease, and some cancers. It is part of a cluster of risk factors called metabolic syndrome. During the recovery period, the visceral fat in the sleep-deprived group continued to rise, even when body weight and subcutaneous fat dropped. Even though they slept more, ate less, and lost weight, their belly fat continued to rise another 50%.

This study adds more importance to the avoidance of chronic sleep deprivation. The metabolic changes and predisposition to metabolic dysfunction are remarkable.

