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A new study shows that total sleep deprivation reduces energy expenditure and may partly explain the connection between poor sleep and an increased risk of obesity.

ENERGY EXPENDITURE IS REDUCED BY SLEEP DEPRIVATION – A POSSIBLE LINK TO OBESITY

Observational and epidemiologic evidence has shown that chronic deficits in sleep are related to an increased risk of obesity, but the mechanisms behind this relation have not been fully explained.

In a recent study published in the *American Journal of Clinical Nutrition* researchers examined the effect of a single night of total sleep deprivation on food intake and morning energy expenditure. Using a balanced crossover design, scientists examined 14 healthy, normal-weight males on 2 occasions during a regular 24 hour sleep-wake cycle (including 8 hours of nocturnal sleep) and a 24 hour period of continuous wakefulness. On the morning after regular sleep and total sleep deprivation, resting and postprandial (after meal) energy expenditures were analyzed. Food intake in both groups was assessed again in the late afternoon after the subjects were given a free-choice food intake from a large buffet. Circulating concentrations of ghrelin, leptin, norepinephrine, cortisol, thyreotropin, glucose, and insulin were repeatedly measured over the entire 24 hour session.

In comparison with normal sleep, resting energy expenditure was reduced by 5% and postprandial expenditure by 20% in the sleep deprived subjects. Nocturnal wakefulness increased morning plasma ghrelin concentrations (a hormone that stimulates hunger), and nocturnal and daytime circulating concentrations of thyreotropin, cortisol, and norepinephrine) as well as morning postprandial plasma glucose concentrations. Changes in food intakes were variable, and no differences between wake and sleep conditions were detected.

These research findings show that one night of sleep deprivation significantly reduces energy expenditure in the short-term, which suggests that sleep contributes to the regulation of daytime energy expenditure in humans.

Christian Benedict et al. Acute sleep deprivation reduces energy expenditure in healthy men Am J Clin Nutr June 2011 vol. 93 no. 6 1229-1236.