

Adverse changes in sleep duration are associated with lower cognitive scores in middle-aged adults

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A study in the May 1 issue of the journal *Sleep* describes how changes in sleep that occur over a five-year period in late middle age affect cognitive function in later life. The findings suggest that women and men who begin sleeping more or less than 6 to 8 hours per night are subject to an accelerated cognitive decline that is equivalent to four to seven years of aging.

Results show that the [sleep](#) duration at follow-up of 7.4 percent of women and 8.6 percent of men had increased from "7 or 8 hours" per weeknight at baseline. Compared with participants whose [sleep duration](#) was unchanged, this change to a longer sleep duration was associated with lower scores at follow-up on five of six cognitive function tests, with the only exception being the test of short-term [verbal memory](#). The sleep duration at follow-up of about 25 percent of women and 18 percent of men had decreased from "6, 7, or 8 hours" per night at baseline. This change to a shorter sleep duration was associated with lower scores at follow-up on three of the six [cognitive tests](#), with reasoning, vocabulary and global cognitive status all being affected adversely. Surprisingly, an increase in sleep duration from six hours or less showed no evidence of a beneficial effect.

"The main result to come out of our study was that adverse changes in sleep duration appear to be associated with poorer cognitive function in later-middle age," said lead author Jane Ferrie, PhD, senior research

fellow in the University College London Medical School Department of Epidemiology and Public Health in the U.K.

The researchers also found that, in women, sleep duration of 7 hours of sleep per night was associated with the highest score for every cognitive measure, followed closely by 6 hours of nightly sleep. Among men, cognitive function was similar for those who reported sleeping 6, 7 or 8 hours; only short and long sleep durations of less than 6 hours or more than 8 hours appeared to be associated with lower scores.

The study used data for 5,431 participants (1,459 women and 3,972 men) from Phase 5 (1997-1999) and Phase 7 (2003-2004) of the Whitehall II study, which included more than 10,000 London-based office staff aged 35-55 working in 20 civil service departments in 1985. Phase 5 and Phase 7 follow-ups involved postal questionnaires and clinical examinations. Cognitive function was assessed at Phase 7 using six standard tests that measured memory, reasoning, [vocabulary](#), phonemic fluency, semantic fluency, and global [cognitive status](#).

Habitual sleep duration was measured at Phase 5 (baseline) and Phase 7 (follow-up) using a single question: "How many hours of sleep do you have on an average week night?" Participants were divided into four groupings based on the change in sleep duration between the two checkpoints: an increase from ≤ 5 hours or 6 hours per night; an increase from 7 or 8 hours per night; a decrease from 6, 7, or 8 hours per night; and a decrease from ≥ 9 hours per night. These groups were compared with reference groups who reported no change in sleep duration between Phase 5 and Phase 7. Overall, about 58 percent of men and 50 percent of women had no change in their self-reported nightly sleep duration during the study period.

Although participants were mostly white-collar workers, the study group covered a wide socioeconomic range with a 10-fold difference in salary

across the occupational hierarchy. The researchers adjusted for the effects of education and occupational position due to their known association with cognitive performance. Socioeconomic status did not account for all the observed associations, indicating either a direct association between change in sleep and cognitive function, or an association mediated or confounded by factors other than education and occupational position.

According to the authors, adequate, good quality sleep is fundamental to human functioning and well-being. Sleep deprivation and sleepiness have adverse effects on performance, response times, errors of commission, and attention or concentration. Furthermore, sleep duration has been found to be associated with a wide range of quality of life measures, such as social functioning, mental and physical health, and early death.

"The detrimental effects of too much, too little and poor quality sleep on various aspects of health have begun to receive more attention," Ferrie added. "Given that our 24/7 society increasingly impinges on the lives of many people, it is important to consider what effects changes in sleep duration may have on health and well-being in the long term."

Provided by American Academy of Sleep Medicine

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