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# The relationship between weight change and daytime sleepiness: the Sleep Heart Health Study

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## ABSTRACT

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*Objective:* Through a causal framework, we aim to assess the association between weight change and daytime sleepiness, and the role of obstructive sleep apnoea (OSA) in this relationship.

*Methods:* From the Sleep Heart Health Study, we selected individuals who were: (1) 40–64 years old, with (2) body mass index (BMI)  $\geq 18.5$  kg/m<sup>2</sup>, (3) no history of stroke, treatment for OSA, and tracheostomy at baseline. We used multiple linear regression to assess the relationship between 5-year weight change and daytime sleepiness (assessed through Epworth Sleepiness Scale (ESS)) at 5 years, adjusting for daytime sleepiness, demographics, diabetes, subjective sleep duration, sleep disturbance, smoking status, weight, and use of antidepressants and benzodiazepines at baseline, in those with complete data ( $N = 1468$ ). We further assessed the potential mediating role of OSA in this relationship.

*Results:* At baseline, the study participants were on average 55 years old, 46% males, with mean BMI 28 kg/m<sup>2</sup>; and 25% had ESS > 10. ESS at 5 years worsened by 0.36 units (95% confidence interval (CI) 0.12–0.61,  $p = 0.004$ ) with every 10-kg weight gain. When stratified by sex, this relationship was only found in women (0.55, 95% CI 0.25–0.86,  $p < 0.001$ ;  $p$ -interaction = 0.02). Approximately one-fifth of the relationship between weight change and daytime sleepiness was mediated by severity of OSA at 5 years.

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