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Cross-sectional associations of objectively-measured sleep characteristics with obesity and type 2 diabetes in the PREDIMED-Plus trial

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Abstract

Study Objectives

To examine independent and combined associations of sleep duration and sleep variability with body composition, obesity and type 2 diabetes (T2D) in elders at high cardiovascular risk.

Methods

Cross-sectional analysis of 1986 community-dwelling elders with overweight/obesity and metabolic syndrome from PREDIMED-Plus trial. Associations of accelerometry-derived sleep duration and sleep variability with body mass index (BMI), waist circumference (WC) and body composition were assessed fitting multivariable-adjusted linear regression models. Prevalence ratios (PR) and 95% confidence intervals (CI) for obesity and T2D were obtained using multivariable-adjusted Cox regression with constant time. "Bad sleepers" (age-specific non-recommended sleep duration plus sleep variability above the median) and "good sleepers" (age-specific recommended sleep duration plus sleep variability below the median) were characterized by combining sleep duration and sleep variability, and their associations with these outcomes were examined.

Results

One hour/night increment in sleep duration was inversely associated with BMI (β −0.38 kg/m^2 [95% CI −0.54, −0.23]), WC (β −0.86 cm [95% CI −1.25, −0.47]), obesity (PR 0.96 [95% CI 0.93, 0.98]), T2D (PR 0.93 [95% CI 0.88, 0.98]) and other DXA-derived adiposity-related measurements (android fat and trunk fat, all $p < .05$). Each 1-hour increment in sleep variability was positively associated with T2D (PR 1.14 [95% CI 1.01, 1.28]). Compared with "good sleepers," "bad sleepers" were positively associated with obesity (PR 1.12 [95% CI 1.01, 1.24]) and T2D (PR 1.62 [95% CI 1.28, 2.06]).

Conclusions

This study revealed cross-sectional associations of sleep duration with adiposity parameters and obesity. Sleep duration and sleep variability were associated with T2D. Considering simultaneously sleep duration and sleep variability could have additional value, particularly for T2D, as they may act synergistically.

sleep duration, night-to-night sleep variability, accelerometry, adiposity, obesity, type 2 diabetes, body composition

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body mass index procedure

diabetes mellitus, type 2

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sleep

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sleep duration

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