

Associations between self-reported daily lifestyle behaviors and objective sleep parameters in a large, real-world sample

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Introduction

- **Lifestyle behaviors** may influence sleep architecture and quality.
- Prior studies have largely relied on self-reported sleep measures or short-duration objective recordings in small samples.
- Little is known about **how multiple daily behavioral variations impact objectively measured sleep parameters** across large, real-world populations.

Methods

- **Sleep was monitored continuously for approximately 2 years** (11/15/2023-11/14/2025) using a commercially available under-mattress device (Sleeptracker-AI Monitor, Fullpower Technologies Inc., California, USA) that continuously records sleep via piezo-electric sensors.
- Participants: mean age 52.9±14.4 years; 48.2% female.
- Analyses included up to **85,706 participants** and up to **2,318,639 nights**; sample size varied by behavior.
- Sleep metrics included:
 - Wake After Sleep Onset (WASO)
 - Total Sleep Time (TST)
 - Rapid Eye Movement (REM %) and Deep Sleep (deep %) Percentages
 - Breathing Anomaly Index (BAI)
 - Arousal Index (ArI)
- Each morning, **participants self-reported exercise, alcohol use, eating before bedtime, sleep-aid use, and TV/mobile device use.**
- Mixed linear models with participant as a random effect were used to derive percentage changes in sleep parameters per behavior.



The Sleeptracker-AI Monitor under-mattress device

Results: Graphs

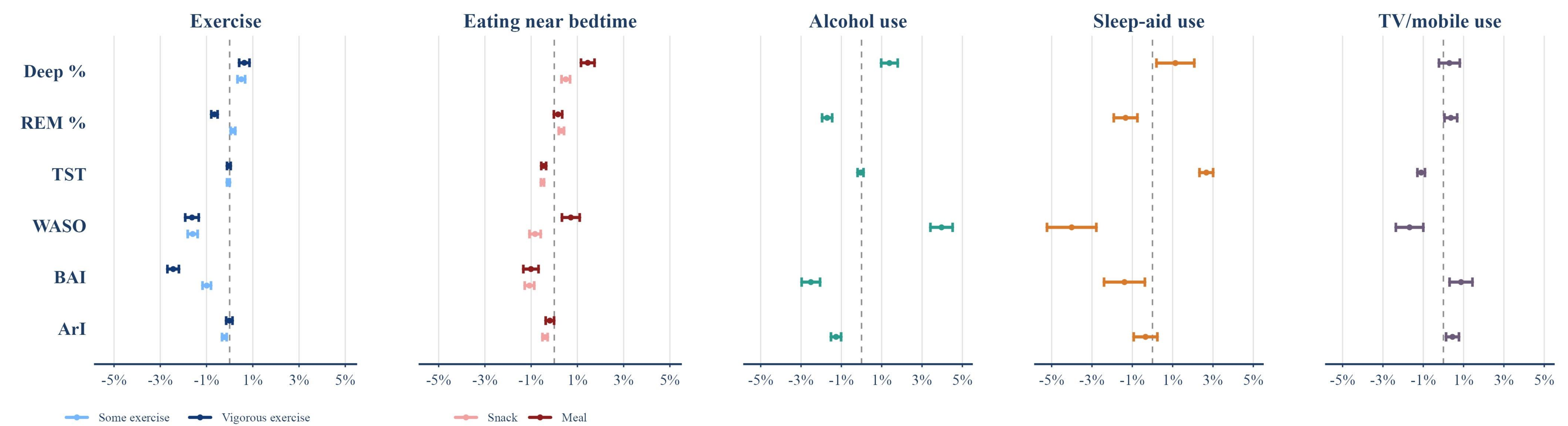


Figure 1. Within-person percent difference in objective sleep parameters associated with self-reported weekday behaviors. Points represent model estimates and horizontal bars indicate 95% confidence intervals.

Results

Lifestyle behaviors were significantly associated with within-person differences in objective sleep parameters (all $p < 0.05$).

- **Exercise:** ↑ deep %; ↓ BAI, WASO, ArI (some exercise only); opposing effects on REM % (higher with some; lower with vigorous).
- **Eating within 2 hours of bedtime:** ↑ deep %, REM % (snacking only); ↓ BAI, TST, ArI; opposing effects on WASO (lower with snack; higher with meal).
- **Alcohol use:** ↑ WASO, deep %; ↓ REM %, BAI, ArI.
- **Sleep-aid use:** ↑ TST, deep %; ↓ BAI, WASO, REM %.
- **TV/mobile device use:** ↑ ArI, BAI, REM %; ↓ WASO, TST.

Conclusions

- Lifestyle behaviors were **associated with measurable differences** in objective sleep metrics, with **effects varying by behavior type and intensity.**
- Non-invasive sleep-tracking technologies offer a powerful way to characterize how lifestyle choices influence sleep health.
- Findings may inform future personalized behavioral sleep interventions.
- **Strengths:** large, real-world sample; within-person design; continuous objective sleep monitoring over 2 years
- **Limitations:** self-reported behavioral data; observational design; sample may not be representative of all populations

