

Weekend Catch-Up Sleep and Dementia Risk: Evidence from Multi-Year Fitbit Tracking in the All of Us Cohort

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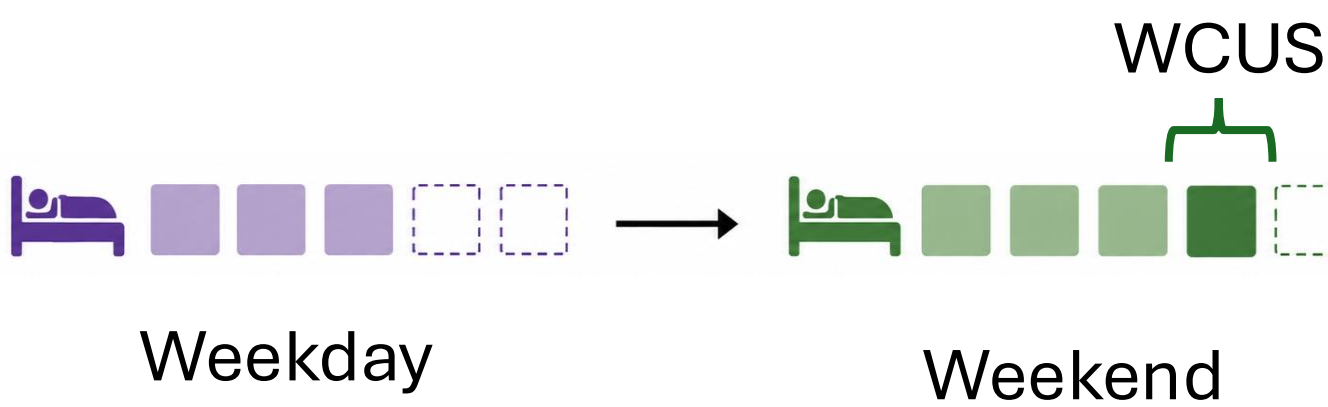
BACKGROUND & OBJECTIVES

Background

- Dementia affects over 55 million people worldwide and is a major cause of disability and dependency among older adults.
- Irregular sleep patterns have been linked to cognitive decline.
- Weekend catch-up sleep (WCUS), defined as extra weekend sleep to offset weekday sleep loss, is increasingly common.
- Whether WCUS influences the long-term risk of dementia and mild cognitive impairment (MCI) remains unclear.
- Evidence from large-scale studies using objective wearable sleep data remains limited.

Objective

To examine the association between objectively measured weekend catch-up sleep (WCUS) and incident dementia and mild cognitive impairment (MCI) in adults aged ≥ 50 years, using multi-year Fitbit sleep data from the NIH All of Us Research Program.



METHODS

Study Design

- Prospective cohort from the All of Us Research Program
- Objective sleep assessment using multi-year Fitbit records
- Linked EHR data for dementia and MCI ascertainment
- Cox proportional hazards models estimated HRs (95% CIs)

Exposure

WCUS = mean weekend – weekday total sleep time



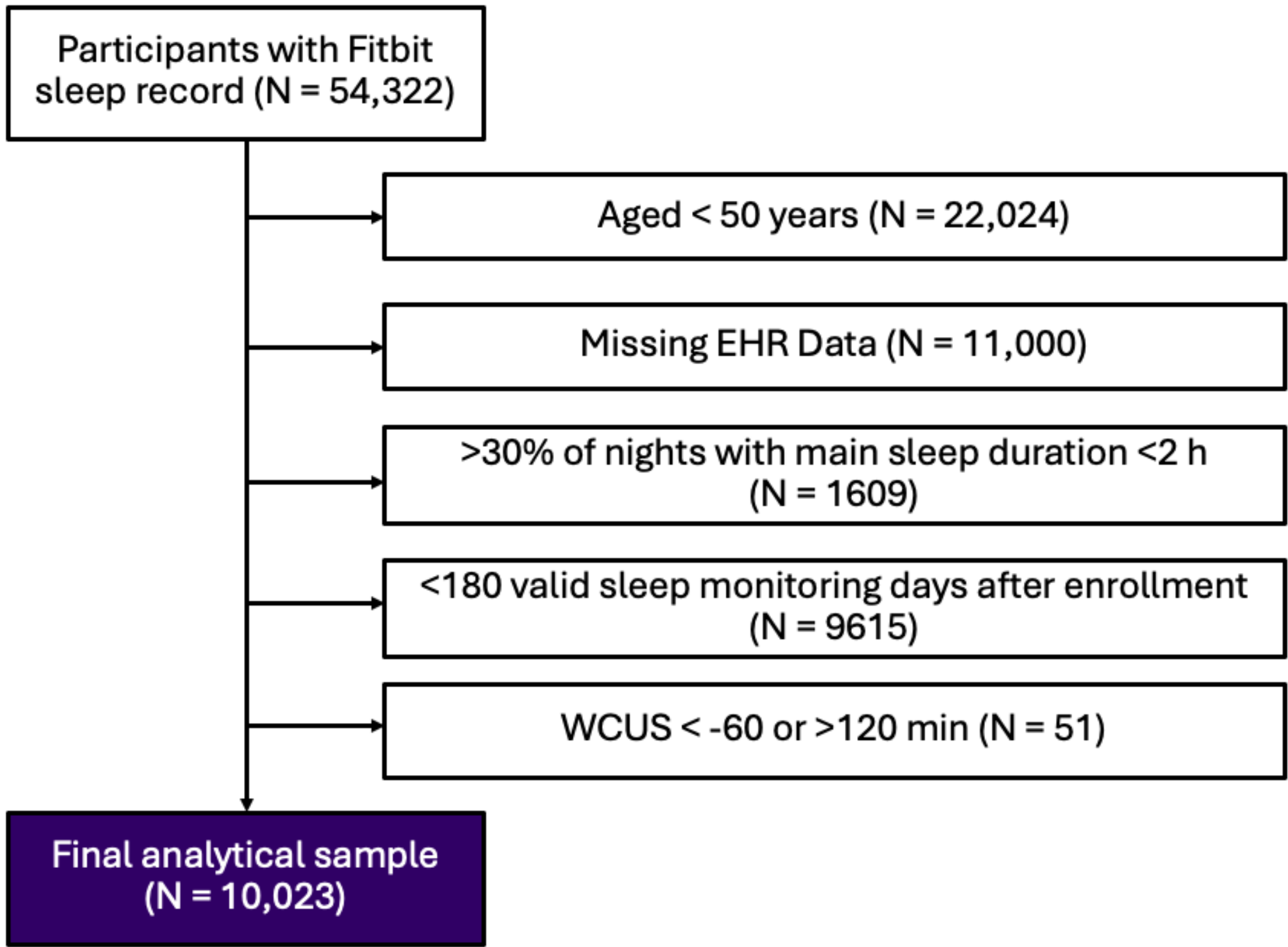
Outcomes

Incident dementia and MCI were ascertained from EHR diagnoses, excluding events within the first 180 days of follow-up.

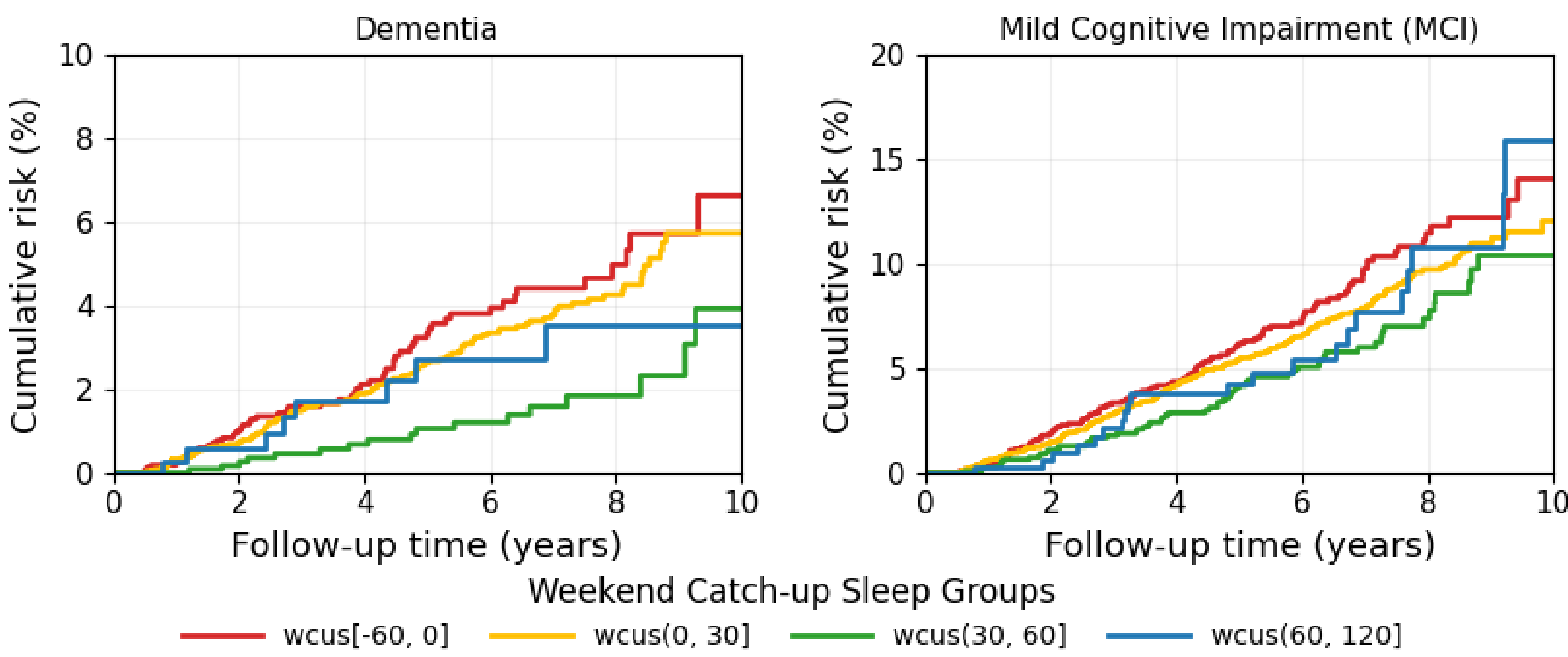
Covariates

Models adjusted for demographic, socioeconomic status, lifestyle, clinical conditions, and sleep characteristics.

Study Population Selection

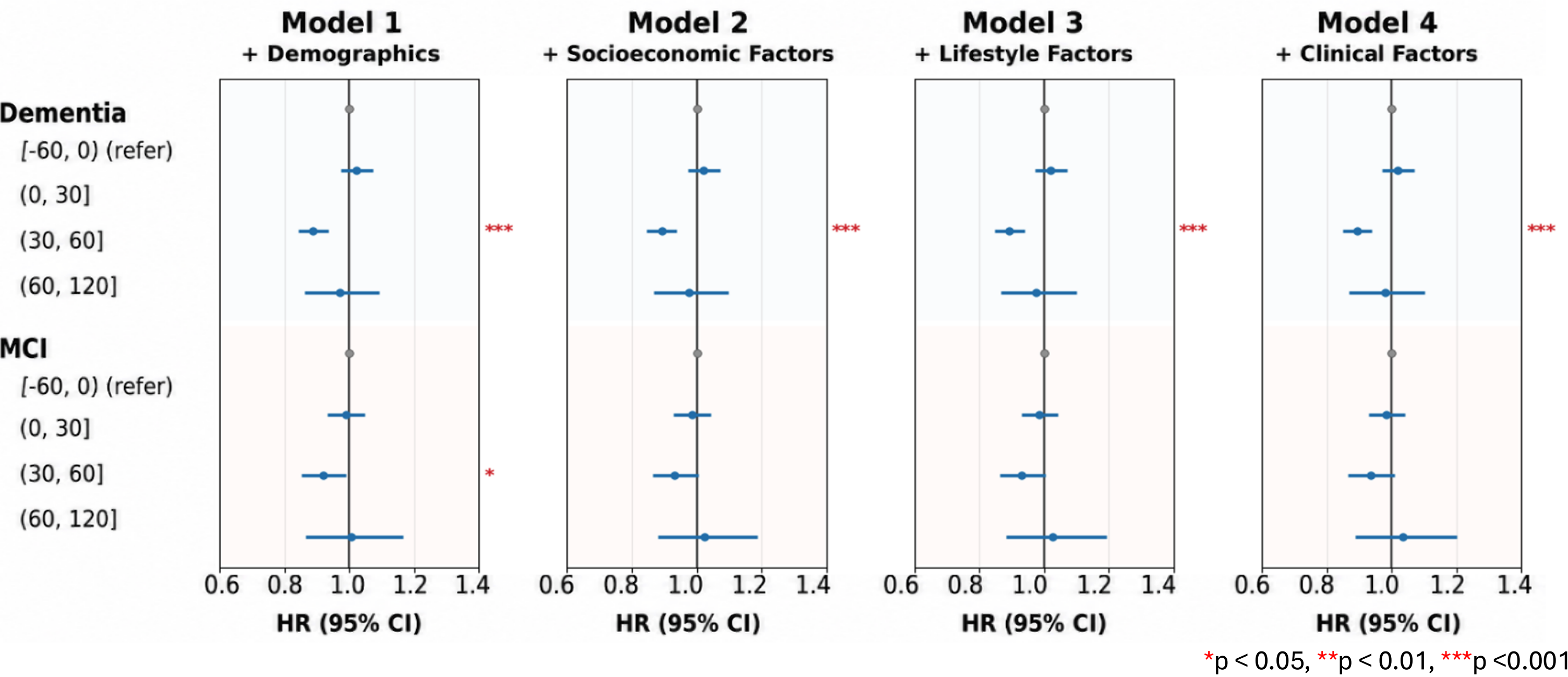


RESULTS 1 Kaplan–Meier Curves



Participants were followed for a median of 3.9 years (IQR 2.0–6.8), during which 210 developed dementia and 471 developed MCI. Kaplan–Meier curves showed the highest dementia incidence in the no/negative catch-up group [–60, 0] and the lowest in the moderate catch-up group (30–60 min); the small (0–30 min) and large (60–120 min) catch-up groups had intermediate risk.

RESULTS 2 Adjusted Hazard Ratios



In fully adjusted Cox models, moderate WCUS was associated with the lowest dementia hazard relative to the reference group. Associations with MCI were null, with no significant differences across WCUS categories.

CONCLUSIONS

Key Findings

Moderate WCUS (30–60 min) was associated with lower dementia risk, whereas minimal or excessive WCUS conferred no clear benefit. Moderate compensation for weekday sleep loss may support healthy brain aging, although the underlying biological mechanisms require further investigation. These findings suggest that encouraging consistent sleep with modest WCUS may represent a simple and scalable strategy to promote brain health in older adults.

Future Directions

Future studies should investigate the biological mechanisms underlying the association between WCUS and dementia, evaluate whether optimizing WCUS through sleep interventions can reduce dementia risk, and validate these findings in more diverse populations with longer follow-up.

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