

Associations between later-life sleep disturbances burden and later-life cognitive and behavioural changes in postmenopausal females

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Introduction:

- **Sleep disturbance** are highly prevalent among postmenopausal females, affecting an estimated 35-60%,¹ but are often overlooked.
- Sleep disturbances are potentially modifiable factors that may be associated with cognitive decline and dementia risk.
- **Subjective cognitive decline (SCD)** and **mild behavioural impairment (MBI)** may represent early changes in cognition and behaviour associated with incident dementia.

Objective: Examine the associations between sleep disturbances and early cognitive complaints and behavioural symptoms in postmenopausal females.

Methods: CAN-PROTECT

- **Sample:** cross-sectional data from 1179 postmenopausal females in CAN-PROTECT study.²
- **Exposure:**
 - Overall sleep disturbance burden
 - 6 self-reported sleep domains: insomnia, long sleep duration, daytime napping, REM/parasomnia symptoms, restless leg symptoms, and sleep-disordered breathing.
- **Outcome:**
 - Subjective cognitive changes assessed using the Everyday Cognition (ECog-II) scale.³
 - Behavioural symptoms assessed using the Mild Behavioral Impairment Checklist (MBI-C).⁴
- **Analysis:** Negative binomial regression models adjusted for age, education, years since menopause, menopause type, ethnocultural background, and menopausal hormone therapy status.



Greater sleep disturbance burden was associated with greater cognitive and behavioural symptoms in postmenopausal females. With long sleep duration and daytime napping having the strongest effect sizes.

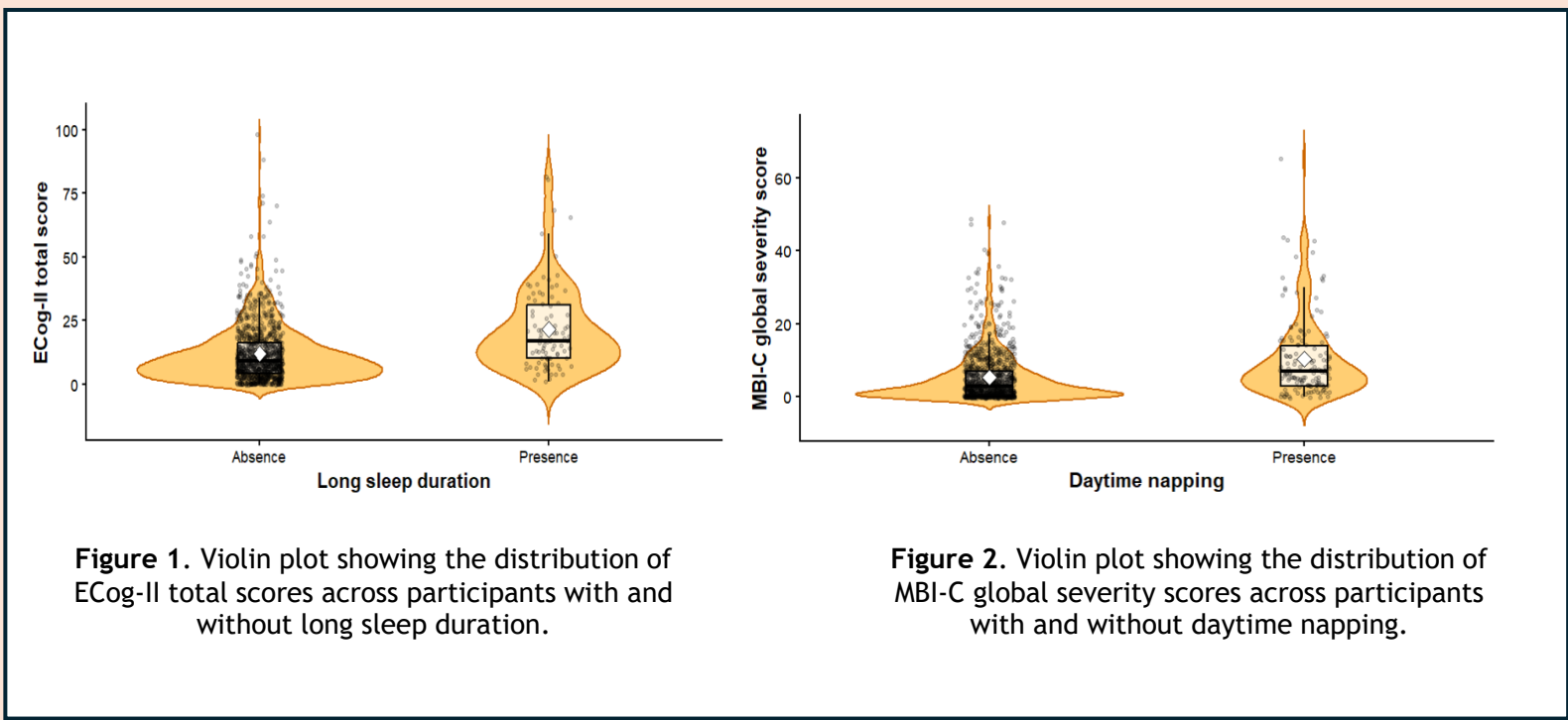


Figure 1. Violin plot showing the distribution of ECog-II total scores across participants with and without long sleep duration.

Figure 2. Violin plot showing the distribution of MBI-C global severity scores across participants with and without daytime napping.

Table 1. Adjusted Associations Between Sleep Domains and ECog-II Total Scores

Sleep characteristic	CR	95% CI	p-value
Overall sleep burden	1.16	1.12-1.20	<0.001
Insomnia	1.14	1.08-1.20	<0.001
Long sleep duration	1.76	1.45-2.13	<0.001
Daytime napping	1.35	1.16-1.58	<0.001
REM / Parasomnia	1.46	1.20-1.77	<0.001
Motor / Restless legs	1.19	1.04-1.36	0.010
Sleep-disordered breathing	1.32	1.18-1.47	<0.001

Table 2. Associations Between Sleep Domains and MBI-C Global Severity Scores adjusted for covariates and cognition.

Sleep characteristic	CR	95% CI	p-value
Overall sleep burden	1.26	1.20-1.31	<0.001
Insomnia	1.29	1.20-1.37	<0.001
Long sleep duration	1.48	1.16-1.90	0.002
Daytime napping	1.85	1.52-2.24	<0.001
REM / Parasomnia	1.31	1.02-1.67	0.033
Motor / Restless legs	1.44	1.22-1.70	<0.001
Sleep-disordered breathing	1.11	0.96-1.27	0.045

CR = count ratio; CI = confidence interval; ECog-II = Everyday Cognition scale; REM = rapid eye movement.

Results:

- Overall sleep disturbance was associated with more subjective cognitive complaints (ECog-II) (CR=1.16, 95% CI:1.12-1.20, $p<0.001$) (Table 1) and behavioural symptoms (MBI-C) (CR =1.32, 95% CI: 1.26-1.38, $p<0.001$) (Table 2).
- All six sleep domains were significantly associated with higher ECog-II and MBI-C scores.
 - Long sleep duration showed the strongest association with cognitive complaints (CR = 1.76, 95% CI: 1.46-2.14) $p<0.001$ (Table 1).
 - Daytime napping showed the strongest association with behavioural symptoms (CR = 2.08, 95% CI: 1.61-2.73), $p<0.001$ (Table 2).

Conclusions:

- Greater sleep disturbance burden was associated with greater cognitive and behavioural symptom burden in postmenopausal females.
- These findings showcase the importance of sleep health in the context of brain health in individuals going through menopause.

Future direction: Longitudinal studies are needed to determine whether sleep disturbances predict cognitive and behavioural changes over time.

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