BRAIN HEALTH IN POSTMENOPAUSAL WOMEN

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

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BACKGROUND

Why does sleep disturbance matter in postmenopausal females?

1. Sleep disturbances affects 35–60% of postmenopausal females yet are normalized as a normal aspect of aging. [1]

2. Sleep disturbances are potentially modifiable factors associated with cognitive decline and dementia risk, yet their relationship with cognition and behaviour in postmenopausal females remains understudied.

3. Declining estradiol during menopause may disrupt sleep regulation, causing difficulty falling asleep and staying asleep, plus early morning awakening.

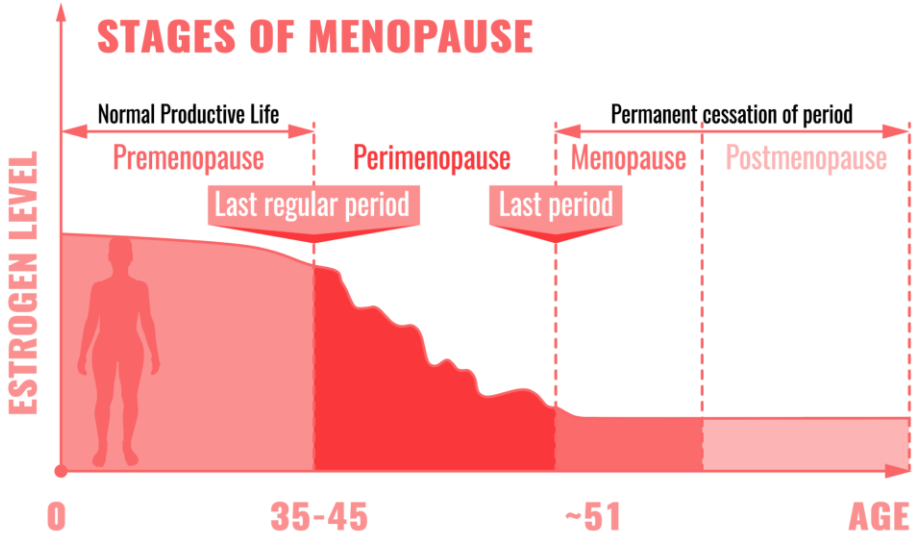


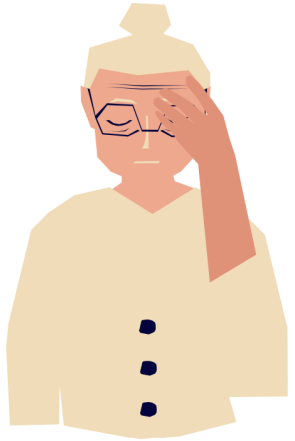
Figure adapted from Pro-Pell Therapy (2018).[5]

RESEARCH AIM

Examine associations between sleep disturbances and cognitive complaints and behavioural symptoms in postmenopausal females.

METHODS





Cross-sectional analysis using **n = 1,200** postmenopausal females from the **CAN•PROTECT** study.[2]

EXPOSURE

Overall sleep disturbance burden was derived from 6 self-reported binary domains:

- Insomnia
- Long sleep duration
- Daytime napping
- REM / parasomnia symptoms
- Motor / restless legs symptoms
- Sleep-disordered breathing

OUTCOMES

- **Subjective cognitive decline** (SCD): Self-reported cognitive decline assessed using Everyday Cognition scale (ECog-II).[3]
- **Mild Behavioural Impairment** (MBI): Later-life behavioural changes associated with incident dementia. Assessed using Mild Behavioral Impairment Checklist (MBI-C).[4]

ANALYSIS

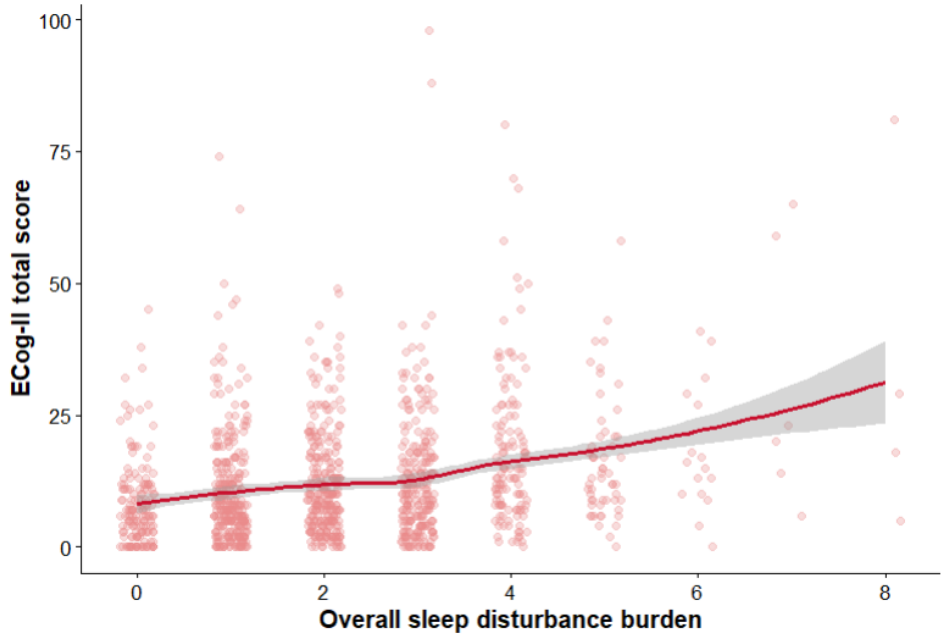
Negative binomial regression models, adjusted for:

- Age
- Ethnocultural background
- Years of education
- Years since menopause
- How menopause occurred
- Menopausal hormone therapy (MHT) status (current, past, or previous)

RESULTS · COGNITION

Sleep disturbance association with ECog-II total scores

Sleep characteristic	CR	95% CI	p-value
Overall sleep disturbance burden	**1.15**	1.12–1.19	<0.001
Insomnia	**1.13**	1.08–1.19	<0.001
Long sleep duration	**1.76**	1.45–2.12	<0.001
Daytime napping	**1.36**	1.16–1.58	<0.001
REM / parasomnia symptoms	**1.46**	1.20–1.77	<0.001
Motor / restless legs symptoms	**1.20**	1.05–1.37	0.006
Sleep-disordered breathing	**1.29**	1.16–1.43	<0.001



CR = count ratio; CI = confidence interval; ECog-II = Everyday Cognition scale; REM = rapid eye movement. Models adjusted for age, education, years since menopause, menopause type, ethnocultural background, and menopausal hormone therapy status.

Key take away:

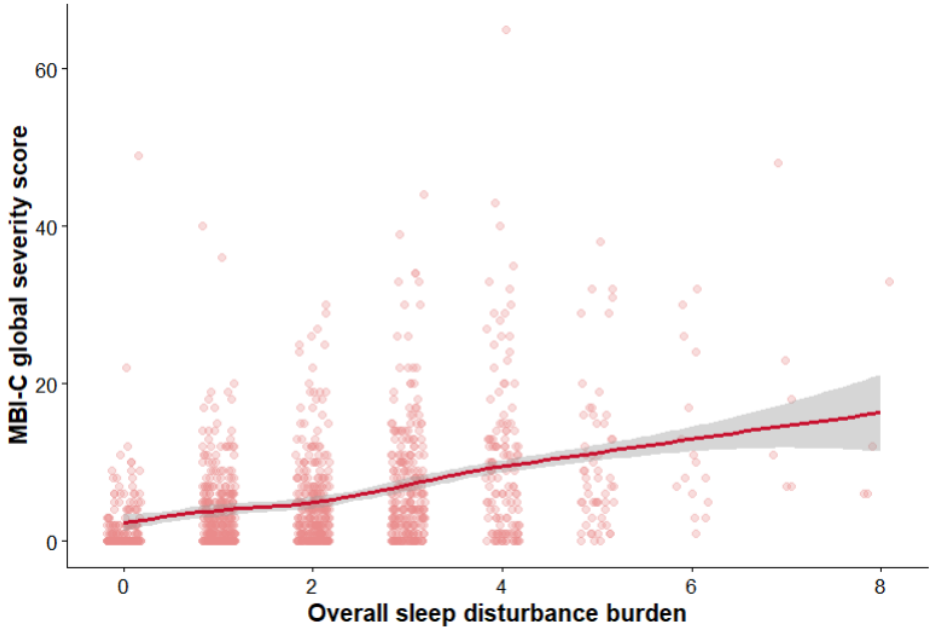
Greater sleep disturbance burden was associated with poorer subjective cognition, individual sleep domains showing associations consistent with the overall sleep disturbance finding.

RESULTS · BEHAVIOUR

Sleep disturbance association with MBI-C total scores

Sleep characteristic	CR	95% CI	p-value
Overall sleep disturbance burden	**1.40**	1.31–1.51	<0.001
Insomnia	**1.48**	1.32–1.64	<0.001
Long sleep duration	**2.16**	1.41–3.32	<0.001
Daytime napping	**2.21**	1.60–3.06	<0.001
REM / parasomnia symptoms	**1.86**	1.14–3.03	0.013
Motor / restless legs symptoms	**1.61**	1.22–2.14	<0.001
Sleep-disordered breathing	**1.27**	1.01–1.60	0.045

CR = count ratio; CI = confidence interval; MBI-C = Mild Behavioural Impairment Checklist; REM = rapid eye movement. Models adjusted for age, education, years since menopause, menopause type, ethnocultural background, menopausal hormone therapy status, and Neuropsychological testing total score.



Key take away:

Greater sleep disturbance burden was associated with greater behavioural symptom burden, with individual sleep domains showing associations consistent with the overall sleep disturbance.

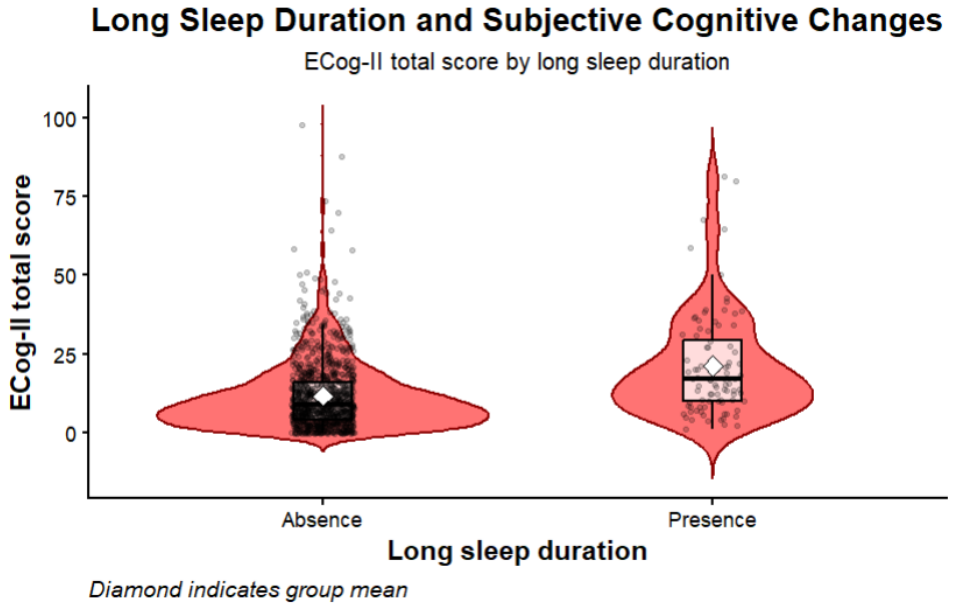
KEY SLEEP DOMAINS

COGNITION — ECog-II

Long sleep duration

CR = 1.76 95% CI: 1.45–2.12, p < 0.001

Long sleep duration showed the strongest association with subjective cognitive complaints.



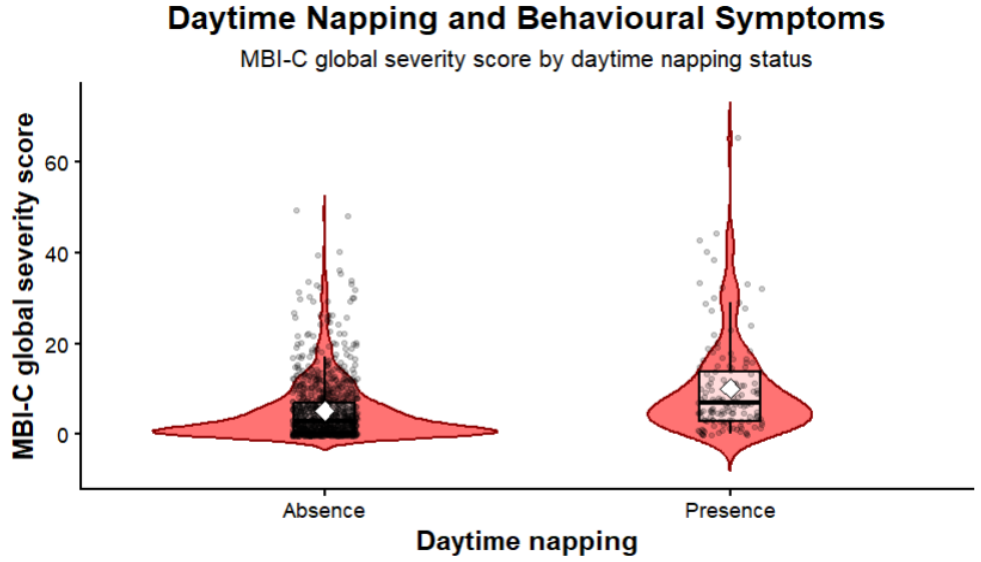
Diamond indicates group mean

Behaviour — MBI-C

Daytime napping

CR = 2.21 95% CI: 1.60–3.06, p < 0.001

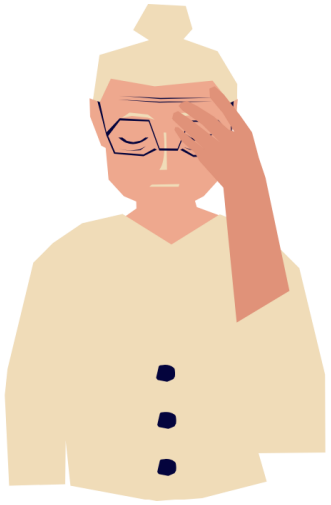
Excessive daytime napping had the strongest association with behavioural symptoms.



Diamond indicates group mean

CONCLUSION

Sleep is a potentially modifiable risk factor in women's brain health



Greater sleep disturbance was associated with worse cognition and behaviour, with long sleep and daytime napping showing the strongest associations, respectively.

These findings showcase the importance of considering sleep disturbance when studying cognitive and behavioural health in postmenopausal females.

Future directions:

1.) Use longitudinal studies to determine whether sleep disturbances predict cognitive and behavioural changes over time.

2.) Examine whether associations vary by menopause type or timing.

3.) Integrate estradiol levels and Alzheimer disease biomarkers to determine whether they influence the relationship between sleep disturbances and future Alzheimer disease risk.

Thank you

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