Supporting Information

Supplementary results

**This appendix was part of the submitted manuscript and has been peer reviewed.
It is posted as supplied by the authors.**

Table 1. Demographic, sleep, health and occupational characteristics of the employed participants who underwent PSG (baseline), commenced productivity data collection (baseline), and completed productivity data collection (12 months).

Characteristic	Sufficient productivity and covariate data (included in analysis)	Employed at baseline, with available PSG data
Participants	554	720
Age (years), mean (SD)	22.1 (0.6)	22.0 (0.5)
Sex (female)	294 (53%)	375 (52%)
Body Mass Index (kg/m^2), median (IQR)	23.9 (21.7-27.1)	23.9 (21.8-27.1)
Sleep characteristics†		
Insomnia	90 (17%)	108 (15%)
Missing data	*13*	*21*
Clinically significant obstructive sleep apnoea	30 (5.4%)*	39 (5.4%)
Missing data	*0*	*0*
Clinically significant restless legs syndrome	2 (0.4%)	6 (0.9%)
Missing data	*3*	*29*
Doctor-diagnosed sleep problem	21 (3.8%)	34 (4.8%)
Missing data	3	10
Occupational characteristics		
Shift worker (yes, %)	156 (28%)	191 (27%)
Work hours/week, median (IQR)	35 (15-40)	35 (15-40)
Work hours/day at baseline, median (IQR)	7.6 (5.7-8.2)	7.6 (5.7-8.3)
Current occupation		
Managers	19 (3.4%)	22 (3.1%)
Professionals	82 (15%)	102 (14%)
Technicians & Trade	79 (14%)	111 (15%)
Community & Personal Services	102 (18%)	132 (18%)
Clerical & Administrative	96 (17%)	118 (16%)
Sales	102 (18%)	132 (18%)
Machinery Operators & Drivers	16 (2.9%)	24 (3.3%)
Labourers	56 (10%)	77 (11%)
Missing	2	2
Health characteristics		
Typical alcohol consumption (days/week)#		
None	28 (5.1%)	40 (5.6%)
<1 day/week	210 (38%)	267 (37%)
1-4 days/week	295 (53%)	376 (52%)
5-7 days/week	21 (3.8%)	35 (4.9%)
Missing	*0*	*2*
Count of comorbidities	1.0 (0-2)	1.0 (0-2)
Mental health‡	84 (15%)	116 (16%)
Missing	2	9
Pain§	143 (26%)	183 (26%)
Missing	2	9
Respiratory condition¶	153 (28%)	201 (28%)
Missing	2	9

IQR = interquartile range; SD = standard deviation. Percentage of sleep disorders totals >100%, as participants could meet criteria for more than one sleep disorder

* Includes participants for whom questionnaire responses regarding insomnia and restless legs syndrome were missing and complete polysomnography detected no evidence of obstructive sleep apnoea.

† Multiple disorders possible for an individual participant.

‡ Anxiety, depression, or eating or weight disorder.

§ Arthritis, back pain, migraine, or neck pain.

¶ Asthma, allergy, or general respiratory condition.

Calculated from frequency responses to alcohol consumption in the Food Frequency Questionnaire.

Table 2. Comparison of included participants with Western Australian population census data for 22-year-old people (2011)

Characteristic	Employed Raine study participants who completed the 12 month productivity measures	Australian Bureau of Statistics Western Australian population census data (2011)[a,1]
Participant	554	
Education		*31,980†*
Post-secondary/equal to tertiary	279 (50.8%)	13,825 (48%)
Missing	*4*	*3,309*
Occupation[b,c]		*22,177*
Professional/managerial	101 (18.2%)	3,976 (18%)
Technicians and trade	151 (27.4%)	7,397 (34%)
Clerical and administrative	96 (17.4%)	3,207 (15%)
Other	204 (37.0%)	7,324 (33%)
Missing	*2*	*274*

[a] 2011 census data provided in accordance with previous comparisons for Raine Gen2-22,[2] due to alignment with the time of cohort follow-up.
[b] Denominator is employed persons.
[c] Categories are provided according to the Australian and New Zealand Standard Classification of Occupations.[3]

Table 3. Adjusted analyses for total workplace productivity loss with complete data on covariate estimates

	Total workplace productivity loss	Total absenteeism	Sickness absenteeism	Lost performance
	IRR (BCa95% CI)	IRR (BCa95% CI)	IRR (BCa95% CI)	IRR (BCa95% CI)
Sleep disorder	1.40 (1.10, 1.76)	1.34 (1.01, 1.79)	1.23 (0.90, 1.76)	1.52 (1.18, 1.95)
Sex (women *v* men)	0.72 (0.57, 0.91)	0.65 (0.49, 0.84)	0.67 (0.46, 0.89)	0.76 (0.60, 0.95)
Per diagnosed medical condition	1.06 (1.00, 1.13)	1.04 (0.96, 1.13)	1.04 (0.96, 1.14)	1.08 (1.01, 1.16)
Shift worker	1.19 (0.94, 1.53)	1.29 (0.96, 1.71)	1.36 (1.00, 1.91)	1.16 (0.93, 1.49)

All models are adjusted for sex, number of reported medical conditions, and shift work status. IRR, incident rate ratio; BCa95% CI, bias corrected and accelerated 95% confidence intervals.

References

1. Australian Bureau of Statistics. Western Australia 2011 Census All persons QuickStats. https://www.abs.gov.au/census/find-census-data/quickstats/2011/5#:~:text=In%20the%202011%20Census%2C%20there,up%203.1%25%20of%20the%20population.&text=The%20median%20age%20of%20people%20in%20Western%20Australia%20was%2036%20years (viewed June 2023).
2. McArdle N, Ward SV, Bucks RS, et al. The prevalence of common sleep disorders in young adults: a descriptive population-based study. Sleep 2020; 43: zsaa072.
3. Australian Bureau of Statistics; Statistics New Zealand. ANZSCO: Australian and New Zealand Standard Classification of Occupations. First Edition, Revision 1. 25 June 2009. https://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/DF6EC104F9730D3ECA2575DF001CB71D/$File/12200_first%20edition%20revision%201.pdf (viewed June 2023).