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# Do psychosocial job stressors differentially affect the sleep quality of men and women? A study using the HILDA Survey

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The aim of this study was to investigate whether gender was an effect modifier of the relationship between three psychosocial job stressors and sleep quality, in a representative sample of 7280 employed Australians. We conducted linear regressions and effect measure modification analyses. Low job control, high job demands and low job security were associated with poorer sleep quality. There was evidence of effect modification of the relationship between job security and sleep quality by gender on the additive scale, indicating that the combined effect of being male and having low job security is greater than the summed interactive effect.

## Introduction

Sleep problems are a significant health concern in Australia, with 41% of men and 56% of women reporting two or more sleep-related difficulties, e.g. nocturnal awakenings and daytime sleepiness.<sup>1</sup> Given the association between poor sleep quality and health,<sup>2</sup> greater understanding of what contributes to the poor sleep quality (of Australians) is critical.

Psychosocial job stressors are an established risk factor for poor sleep quality.<sup>3</sup> However, the evidence for gender differences in the relationship between psychosocial job stressors and sleep outcomes varies considerably.<sup>4</sup> To date, most of these studies have only disaggregated the results by gender, without considering that gender may moderate the effect of psychosocial job stressors on sleep. Effect measure modification (EMM)<sup>5</sup> approaches facilitate comparison between and within strata (e.g. presence of job stressors and gender) and consider the additive effects, providing additional insight into this relationship.

Thus, the current study examined whether gender was an 'effect modifier' in the relationship between job stressors and sleep quality in Australian women and men.

## Methods

### Data source

Established in 2001, the Household, Income and Labour Dynamics in Australia (HILDA) survey is a longitudinal, nationally representative study of over 7000 households in Australia.<sup>6</sup>

For the purpose of this study, only data from Waves 12 (2012) and 13 (2013) were included. To study job stressors, only people who were employed (including self-employed) in Wave 12 and aged 15–64 years were included. If a participant had missing data on the exposures, outcomes or confounding variables, they were excluded from the analyses. Our analytic sample comprised of 7280 people (3693 men and 3587 women). Supplementary file S1 shows the selection of the study sample.

The HILDA Survey received ethics approval from The University of Melbourne Human Research Ethics Committee and was conducted in accordance with the Helsinki Declaration as revised in 2008.

### Outcome variable

HILDA Wave 13 included seven questions pertaining to sleep quality over the last month. These questions addressed subjective sleep quality, sleep duration, sleep disturbance, use of sleep medications and daytime dysfunction. A composite measure of sleep quality was created, following Magee *et al.*<sup>7</sup> (Cronbach's alpha = 0.69 for our sample). This measure was created based on the scoring algorithm of the validated Pittsburgh Sleep Quality Index, a validated measure of sleep quality.<sup>8</sup> We used the total score in our analyses, with higher scores indicating poorer sleep quality (range 0–18).<sup>7</sup>

### Exposure variables

Three psychosocial job stressors were examined: job control, assessed from 11 items such as, 'I have freedom to decide how I do my work'; job demands, assessed from 4 items such as 'My job is complex and difficult' and job security, assessed from 3 items such as 'I have a secure future in my job'. All questions had a seven point Likert-scale (from strongly disagree to strongly agree). One job security question was phrased in a different direction and was reversed for analysis. Scores for job control, job demands and job security were summed then dichotomized based on a median split, as previously done.<sup>9</sup>

### Effect modifier

Gender (man/woman) was included in our models as an effect modifier, as per Knol and VanderWeele.<sup>5</sup>

**Table 1** Examining gender as an effect modifier in the relationship between job security and sleep quality, using the effect measure modification approach by Knol and VanderWeele ( $N = 7280$ )

Sleep quality	High job security, coef. (95% CI)	Low job security, coef. (95% CI)	Coef. (95% CI) for job security within strata of gender
Women	0.000 (ref)	0.412 (0.209, 0.616) $P < 0.001$	0.412 (0.209, 0.616) $P < 0.001$
Men	-0.423 (-0.617, -0.230) $P < 0.001$ EMM on additive scale: 0.358 (0.080, 0.636) $P = 0.012$	0.347 (0.138, 0.555) $P = 0.001$	0.770 (0.580, 0.961) $P < 0.001$

## Confounders

Variables that could be considered confounders for psychosocial job stress and sleep quality were included in the analysis. These included age, education, income, job contract type, living arrangement, occupation, long-term health conditions (self-reported long-term health condition, disability or impairment) and country of birth.

## Statistical analysis

Sleep quality was measured in Wave 13. To align with the theorized temporal sequencing in which exposure precedes outcome, the exposure and confounding variables were measured 1 year earlier in Wave 12 of HILDA. All analyses were conducted using STATA 16.0.<sup>10</sup>

We conducted separate linear regressions for job control, job demands and job security, with sleep quality as the outcome (unadjusted, Model 1; adjusted for age, Model 2 and adjusted for all confounders, Model 3). We then included gender as an interaction term in the fully adjusted models. The statistical significance of the relationship was determined based on the interaction term and the results of a likelihood ratio test comparing a model with the interaction term and main effects with one that included main effects only. There was a significant interaction between gender and job security only. Thus, we used the approach to presenting effect modification results as recommended by Knol and VanderWeele<sup>5</sup> only for job security. We present estimates and 95% confidence intervals (CIs) within the strata of gender and job security. We computed measures of effect modification on the additive scale.

## Results

A description of the analytic sample (disaggregated by gender) included is in Supplementary file S2. Median scores for each job stressor were: job control = 49 (range 0–77), job demands = 18 (range 4–28) and job security = 16 (range 3–21). Average sleep quality was slightly worse for women, than men [ $t(7278) = 3.92$ ,  $P \leq 0.001$ ; women (M, SD): 4.39, 3.09 and men: 3.11, 2.96].

Low job control ( $\beta$  coef: 0.264,  $P = 0.001$ , 95% CI: 0.110–0.418), high job demands ( $\beta$  coef: 0.602,  $P < 0.000$ , 95% CI: 0.456–0.747) and low job security ( $\beta$  coef: 0.596,  $P < 0.000$ , 95% CI: 0.456–0.736) were associated with poorer sleep quality (see Supplementary file S3 for the results of all models).

There was a significant interaction between gender and job security (LR test:  $\text{prob} > \chi^2 = 0.011$ ), but no interaction between gender and job control or job demands. There was evidence of EMM of the relationship between job security and sleep quality by gender on the additive scale ( $\beta$  coef: 0.358,  $P = 0.012$ , 95% CI: 0.080–0.636) (see table 1). In stratum-specific results, it was evident that compared with women with high job security, women with low job security had poorer sleep quality ( $\beta$  coef: 0.412,  $P < 0.001$ , 95% CI: 0.209–0.616) and men with low job security had poorer sleep quality compared with men with high job security ( $\beta$  coef: 0.770,  $P < 0.001$ , 95% CI: 0.580–0.961).

## Discussion

Consistent with existing literature,<sup>4</sup> we have demonstrated that individuals experiencing low job control, high job demands or low job security reported poorer sleep quality compared with those with better psychosocial job conditions. Additionally, there was evidence that gender modified the relationship between job security and sleep quality on the additive scale, indicating that the combined effect of being male and having low job security is greater than the summed interactive effect. Additionally, our stratum-specific findings highlighted that for both genders, those with low job security had poorer sleep quality compared with those with high job security.

Despite women's increasing workforce participation over recent decades, Australian men are still more likely to work full-time and earn more. This 'breadwinning' burden may partially explain why perceived job security has a greater effect on men's sleep quality, compared with women's. Indeed, previous research indicates that men with traditional gender ideology experience greater job insecurity-related stress compared with traditional women, although job insecurity-related stress appeared similar for egalitarian men and women.<sup>11</sup>

This study utilized a large representative sample of Australians and is the first study to examine gender as an effect modifier in the relationship between psychosocial job stressors and sleep quality. However, at the time of analysis, we could access only had one wave of sleep data, limiting our analysis and preventing us from controlling for baseline sleep quality. Therefore, we cannot exclude the possibility of reverse causality, although we note that our modelling approach in which exposure was collected in the wave prior to the outcome attenuates this risk.

## Conclusion

In conclusion, improving job quality may be beneficial to sleep quality. Specifically, providing job security may improve the sleep quality of both men and women and will likely have a larger effect on men.

## Supplementary data

Supplementary data are available at *EURPUB* online.

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Tragically, A.M. died during the final revisions of this article. The authorship team wishes to honour the memory of A.M., whose intellect, wit and passion for research will never be forgotten. We would also like to acknowledge Ms. Yamna Taouk for her assistance with the STATA code for the analyses.

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## Key points

- This article presents evidence of effect modification of the relationship between job security and sleep quality by gender.
- Findings indicate that the combined effect of being male and having low job security is greater than the summed interactive effect.
- Providing job security may improve sleep for both genders, but will likely have a larger effect on men.

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*Conflicts of interest:* None declared.

## References

- 1 Adams RJ, Appleton SL, Taylor AW, et al. Sleep health of Australian adults in 2016: results of the 2016 Sleep Health Foundation national survey. *Sleep Health* 2017;3: 35–42.
- 2 Matricciani L, Bin YS, Lallukka T, et al. Past, present, and future: trends in sleep duration and implications for public health. *Sleep Health* 2017;3: 317–23.
- 3 Linton SJ, Kecklund G, Franklin KA, et al. The effect of the work environment on future sleep disturbances: a systematic review. *Sleep Med Rev* 2015; 23:10–9.
- 4 Johannessen HA, Sterud T. Psychosocial factors at work and sleep problems: a longitudinal study of the general working population in Norway. *Int Arch Occup Environ Health* 2017;90:597–608.
- 5 Knol MJ, VanderWeele TJ. Recommendations for presenting analyses of effect modification and interaction. *Int J Epidemiol* 2012;41:514–20.
- 6 Summerfield M, Freidin S, Hahn M, et al. 'HILDA User Manual – Release 13', Melbourne Institute of Applied Economic and Social Research, University of Melbourne, 2014.
- 7 Magee CA, Robinson LD, McGregor A. The work-family interface and sleep quality. *Behav Sleep Med* 2018;16:601–10.
- 8 Buysse DJ, Reynolds CF, Monk TH, et al. The Pittsburgh Sleep Quality Index: a new instrument for psychiatric practice and research. *Psychiatry Res* 1989;28: 193–213.
- 9 Karasek R, Brisson C, Kawakami N, et al. The Job Content Questionnaire (JCQ): an instrument for internationally comparative assessments of psychosocial job characteristics. *J Occup Health Psychol* 1998;3:322–55.
- 10 StataCorp. 2019. Stata Statistical Software: Release 16. College Station, TX: StataCorp LLC.
- 11 Gaunt R, Benjamin O. Job insecurity, stress and gender. *Community, Work Fam* 2007;10:341–55.