

Effort-reward imbalance and risk of sleep disturbances in the Danish Work Environment Cohort Study

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Background

Sleep disturbances are associated with a wide range of health problems and diseases, including coronary heart disease, diabetes, obesity, and depression. The aim of this study was to analyze whether adverse psychosocial working conditions, defined by the model of effort-reward imbalance (ERI), increase the risk of sleep disturbances in the Danish workforce.

Methods

We analyzed data from 2614 Danish employees, aged 18-59 (50% women), from a representative sample of the Danish workforce. An ERI-ratio was calculated by dividing an effort scale through a reward scale, with a higher ratio indicating an imbalance between high effort and low reward. Sleep disturbances were measured with 2 items, addressing problems falling asleep and early awakening. We analyzed data with multiple regression analyses, both cross-sectionally and for a five-year follow-up.

Results

Figure 1: ERI and disturbed sleep: Cross-sectional analysis

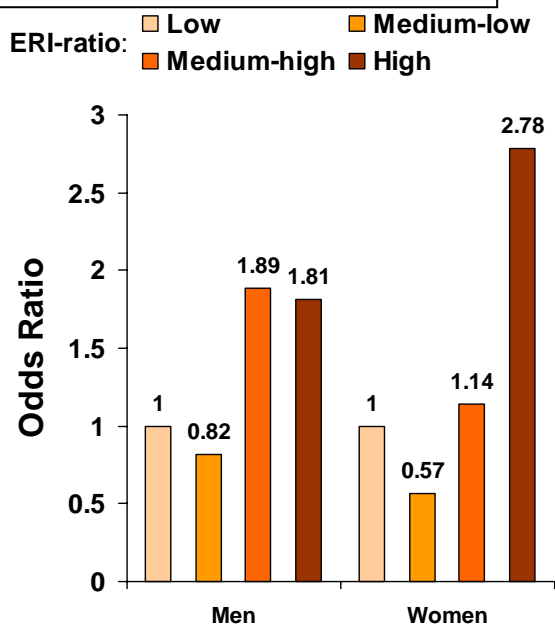
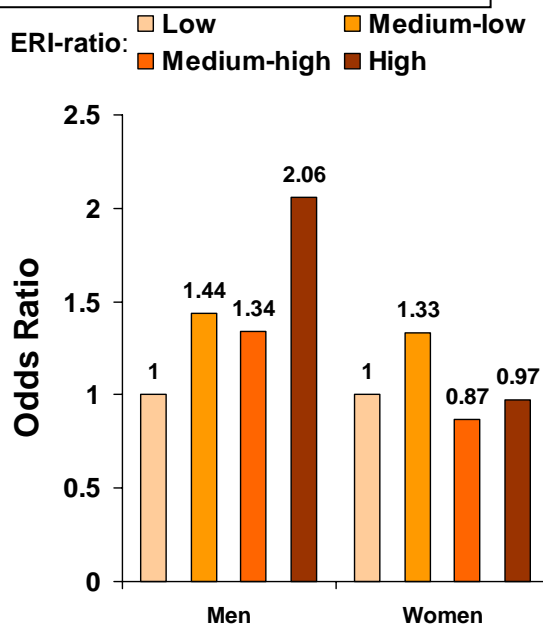


Figure 2: ERI and disturbed sleep: Prospective analysis



Analyses are adjusted for survey method, age, occupational grade, cohabitation, age of youngest child at home, smoking alcohol consumption, physical activity, BMI, self-rated health, sickness absence, weekly working hours, work time arrangement

Effort-reward imbalance was associated with an increased likelihood of sleep disturbances in the cross-sectional analysis, (figure 1). A 1 standard deviation increase of the ERI-ratio was associated with an OR of sleep disturbances of 1.65 (95% CI=1.20-2.27, $p=0.002$) and 1.82 (95% CI=1.46-2.28, $p<0.001$) among men and women respectively. In the longitudinal analysis, 304 (12.9%) of the 2351 participants, initially free of sleep disturbances, developed sleep disturbances during the five-year follow-up. ERI at baseline predicted onset of sleep disturbances among men (figure 2); a 1 standard deviation increase of the ERI-ratio predicted a 1.39 increased risk (95% CI=1.03-1.87, $p=0.03$). Among women, ERI at baseline was not associated with an increased risk of sleep disturbances (OR=0.97, 95% CI=0.76-1.24, $p=0.81$).

Conclusion

Effort-reward imbalance was cross-sectionally associated with sleep disturbances in both genders and predicted onset of sleep disturbances in men in a five-year follow-up.

Reference

Rugulies R, Norborg M, Sørensen TS, Knudsen LE, Burr H. Effort-reward imbalance at work and risk of sleep disturbances. *Journal of Psychosomatic Research* 2009;66(1):75-83.