Men Show Greater Association Between Chronic Pain and Workplace Stress

Gianluca Guglietti[1], Matthew Fillingim[2], Azin Zare[1], Jax Norman[1], Christophe Tanguay Sabourin[2], Luda Diatchenko[1,3], Etienne Vachon-Presseau[1,3]

[1] Faculty of Dentistry, McGill University, [2]Integrated Program in Neuroscience, McGill University, [3]Department of Anesthesiology, McGill University

Introduction

Both sex and socioeconomic status (SES) are shown to be associated with chronic pain, but the interaction of these factors is poorly understood. Increased physical and emotional stress can both mediate SES's relationship with pain. This study investigates the interaction between these factors and sex on chronic pain outcomes.

Methods

Population: Data was obtained from the **United Kingdom Biobank** (UKBB) (n=533,489) and the **Northern Finland Birth Cohort** (NFBC) (n=12,231), where we have access to pain status and psychosocial data for a diverse population of over half a million individuals.

Pain Phenotyping: Participants were asked at which body sites they experienced pain interfering with daily activity and whether that pain had lasted for longer than 3 months.

Work Questionnaires: Questionnaires on job type, job satisfaction, and work-related physical stress were provided.

Analysis: Chi-squared test and odds ratios were used to determine differences in pain across job types. Linear regression was utilized to measure the association between pain severity (measured by number of co-occurring pain sites) and work-related factors after stratifying by sex. Participants were stratified by sex and in the final analysis by work type (intellectual vs physical labour).

Results

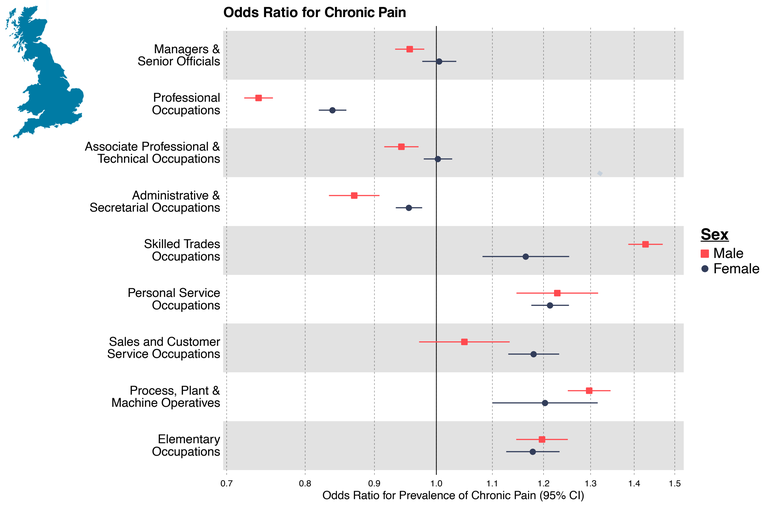

Figure 1 *Odds of having chronic pain based on job type and sex in the United Kingdom Biobank.* Forest plot shows log-OR of having chronic pain given an individual's job type and sex. Individuals in professional occupations were least likely to experience chronic pain whereas individuals in skilled trades and personal services were most at risk.

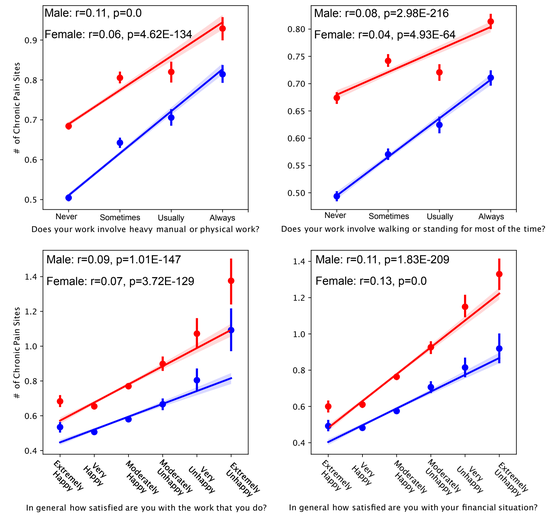

Figure 2 *Association between number of chronic pain sites and ratings of work stress and satisfaction. Men show stronger associations between pain and ratings of physical exertion at work and work satisfaction. Women show stronger association with financial satisfaction.*

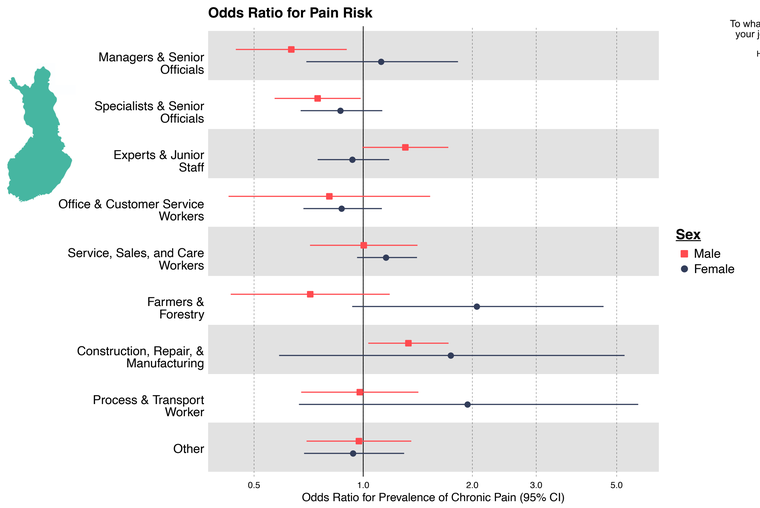

Figure 3 Odds of having chronic pain based on job type and sex in the Northern Finland Birth Cohort. Men showed increased risk of developing chronic pain in Construction, Repair, & Manufacturing work and decreased risk of pain as Specialist & Managers.

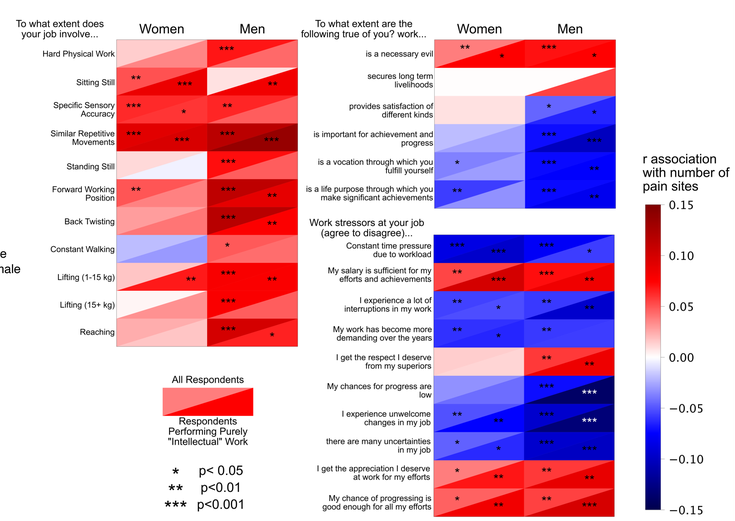

Figure 3 *Association between spread of pain and work place stressors. Triangulated heatmap shows associations stratified by sex. Each rectangle is split with the association in the full population on the upper left and and respondents only participating in "intellectual work" on the lower right to control for the over representation of men in physical labour.*

Discussion

1) Differences in Job type show a stronger relationship with chronic pain in men than in women, these findings are consistent across cohorts.

2) Physical stressors associated with work show a stronger relationship with chronic pain severity in men than in women

Future Directions

1) Develop multivariate model using partial least squared regression to better summarize work's association with chronic pain

2) Using longitudinal data in both the UKBB and NFBC we will perform analyses of the association between work life factors and pain over multi year follow up periods toe better unravel the causal direction of these effects.

References

1. Bartley EJ, Fillingim RB. Sex differences in pain: a brief review of clinical and experimental findings. BJA: British Journal of Anaesthesia. 2013;111(1):52–58.
2. Pelletier R, Ditto B, Pilote L. A composite measure of gender and its association with risk factors in patients with premature acute coronary syndrome. Psychosomatic Medicine. 2015;77(5):517–526.
3. Johnson JL, Greaves L, Repta R. Better science with sex and gender: Facilitating the use of a sex and gender-based analysis in health research. International Journal for Equity in Health. 2009;8:14.
4. Vermeulen A, Verdonck L, Kaufman JM. A Critical Evaluation of Simple Methods for the Estimation of Free Testosterone in Serum. The Journal of Clinical Endocrinology & Metabolism. 1999; 1(10):3666–3672