

## ***Association between work-related stress and major depression: 15-year follow-up results from the PROspective Quebec cohort***

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### **Introduction**

Depression is a common mental disorder currently affecting more than 300 million people worldwide, with lifetime prevalences ranging from 10-15%. According to data presented by the World Health Organization in 2018, depressive disorders were one of the top three causes of disability-adjusted life years [1] and are expected to rank first by the year 2030. In addition to human suffering, depression causes high economic costs; for example in 2010, total costs of depression were estimated at \$202 billion in the US [2] while in Europe, total costs related to depression were estimated at approximately €92 billion [3].

Although the mechanisms involved in the development of depression are poorly understood, its incidence is known to be higher during the years of labour market participation, between the ages of 25 and 45 years [4]. It is also known that work-related stress affects approximately a quarter of the working population [5] and may negatively impact workers' mental health.

Indeed, previous studies have observed a positive association between work-related stress, as operationalized by the Demand-Control model, and symptoms of depression [6]. Another recognized model, the Effort-Reward Imbalance (ERI) model, also captures valuable aspects of work-related stress. Per this model, a perceived lack of reciprocity between the efforts invested at work and the rewards received leads to ERI, an important work-related stressor. To date, there is a lack of longitudinal studies using validated instruments to examine the long-term effect of work-related stress, according to the ERI model, on depression [7].

The aim of this paper is to determine whether workers exposed to a combination of high efforts and low rewards at work have a higher prevalence of major depression (as measured by the CIDI, a validated instrument) than unexposed workers 15 years later.

### **Methods**

*Population:* PROspective Quebec (PROQ) is a longitudinal cohort of 9188 working women and men from Quebec, Canada. Altogether there are now 25 years of follow-up and three waves of data collection [8]. Here, we present data on participants who were working during the

second wave (1999-2001) and who agreed to be interviewed at the end of follow-up (n=4749; 2371 women and 2378 men).

*Outcome:* Major depression was measured in 2015-2018 using the Composite International Diagnostic Interview-Short Form (CIDI-SF) [9] according to DSM-IV criteria. Participants with a certified absence from work due to mental health problems, including depression, during the year before baseline (1991-1993) were excluded.

*Exposition:* Work-related stress was measured in 1999-2001 using a validated French version of the ERI questionnaire [10].

*Covariables:* Sociodemographic variables, such as age, sex, education level, income and occupation type, and health behaviours, such as physical activity, alcohol and tobacco consumption, were measured at each data collection wave.

*Analysis:* The effect of ERI on the prevalence of major depression was estimated using a marginal structural model with logistic regression. Missing values (< 5% per variable) were imputed and possible confounding effects of the time-varying covariables were mitigated through the use of inverse probability of exposition weights.

### **Preliminary results**

Overall, the prevalence of depression was 4.0%. Prevalence of depression among women was 2.3 times higher than among men (5.5% and 2.4%, respectively). After adjustment for possible confounding factors, the overall odds ratio for depression among participants exposed to ERI, compared with unexposed participants, was 1.9 (95% confidence interval:1.4-2.6).

### **Preliminary conclusions and next steps**

These preliminary results point to a strong long-term effect of work-related stress on depression. They will be updated at the time of the conference to include the incidence of depression during the 15 years of follow-up, as measured by the use of health services.

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