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Short report

# Emotional demands at work and risk of disability pension: a nationwide cohort study in Denmark

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## ABSTRACT

**Introduction** Working in emotionally demanding jobs is associated with an increased risk of temporarily leaving the labour market due to long-term sickness absence. We tested whether employees working in emotionally demanding jobs are also at higher risk of permanently leaving the labour market due to disability pension compared with employees working in jobs that are not emotionally demanding.

**Methods** We conducted a 10-year cohort study in the workforce in Denmark (n=1 670 825), aged 30–59 years at baseline, by linking job exposure matrices with nationwide registries on social transfer payments and covariates. Using Cox regression, we analysed the risk of disability pension in relation to emotional demands in the full population and sex stratified. Multivariable adjusted models included sex, age, cohabitation, migration background, household disposable income and other work environmental factors (physical workload, influence, possibilities for development and role conflicts).

**Results** We identified 67 923 new cases of disability pension during 15 649 743 person-years of follow-up (mean follow-up: 9.4 years). We found an increasing risk of disability pension with higher levels of emotional demands, with HRs of 1.20, 1.23 and 1.73 for medium-low, medium-high and high emotional demands, respectively, compared with low emotional demands in the most adjusted model. There was an exposure–response association in women and a tendency towards an exposure–response association in men.

**Discussion** In this nationwide cohort study, we found an increased risk of permanent exit from the labour market due to disability pension in women and men working in emotionally demanding jobs.

## INTRODUCTION

Dealing with emotions of people whom employees must take care of (eg, clients, patients, pupils and customers) as a part of their job is emotionally demanding.<sup>1</sup> We recently reported that employees working in emotionally demanding jobs are at increased risk of long-term sickness absence (LTSA), in both Denmark and Sweden.<sup>2–4</sup>

While emotional demands at work are linked to LTSA, that is, temporarily leaving the labour market, previous studies reported that emotional demands are not linked with an increased risk of permanently leaving the labour market.<sup>5,6</sup> These studies were, however, conducted with small and selected study populations. Another limitation is

## WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Working in emotionally demanding jobs is associated with an increased risk of temporarily leaving the labour market due to long-term sickness absence.

## WHAT THIS STUDY ADDS

⇒ In this nationwide cohort study, we found an increased risk of permanent exit from the labour market due to disability pension in women and men working in emotionally demanding jobs.

## HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Emotional demands are prevalent in several occupations involving person-related work. There is a need to both reduce emotional demands at work and identify workplace factors that may buffer the adverse effects of emotional demands on disability pension and to test these in workplace interventions.

possible reporting bias due to self-reported exposure measurements.

We, therefore, aimed to test in a large study population, encompassing an entire national workforce in the age group 30–59 years and applying non-self-reported exposure measurement, if employees in emotionally demanding jobs are at higher risk of permanently leaving the labour market due to disability pension, compared with employees in jobs that are not emotionally demanding.

## METHODS

### Study design and population

We analysed data from the Job Exposure Matrix Analyses of Psychosocial Factors and Healthy Ageing in Denmark (JEMPAD) cohort, a Danish nationwide cohort with information on working conditions, health and labour market participation. JEMPAD includes all employed individuals residing in Denmark in the year 2000, aged 30–59 years with complete data on age, sex and migration background, a total of 1 680 214 individuals. Individuals who received disability pension before or during the baseline year were excluded, yielding a final study population of 1 670 825 individuals. Mean age was 43.8 years (SD: 8.4 years) and 48.4% were women.



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We followed the cohort for incident disability pension for up to 10 years, from 1 January 2001 to 31 December 2010.

### Emotional demands at work

We measured emotional demands at work with a job exposure matrix (JEM) based on information from the Danish Work Environment Cohort Study (DWECS). DWECS is a survey on working conditions and health, conducted in a randomly selected sample of the Danish workforce from 1990 to 2010. Details on DWECS items, scale and JEM construction are published elsewhere<sup>3</sup> and provided in online supplemental material. Briefly, using the 2000 and 2005 DWECS waves, we constructed a scale by calculating the mean of the three items on emotional demands. Using multilevel modelling, we constructed the JEM as the predicted level of emotional demands given occupational group (coded according to DISCO-88, the Danish version of the International Standard Classification of Occupations-88 system), sex, age and year of data collection. Using the year 2000 specific JEM, we assigned the predicted level of emotional demands to all individuals in the study population according to occupational group, sex and age at baseline.

We categorised individuals into four exposure groups based on quartile split of the distribution of the JEM values, that is, low (reference group), medium-low, medium-high and high emotional demands.

### Disability pension

We identified disability pension in the Danish Register for Evaluation of Marginalisation (DREAM)<sup>7</sup> by the code '783'. DREAM includes weekly information on all social transfer payments in Denmark since 1991, including disability pension. In Denmark, disability pension is granted by municipalities based on a work-ability assessment. Part-time disability pension and returning to work from disability pension are rare in Denmark.<sup>8</sup>

### Covariates

Covariates were measured in 2000 and included sex, age, migration background, household disposable income and four other working conditions (physical workload, influence, possibilities for development and role conflicts). Information on covariates

was retrieved from population-based registers,<sup>9–11</sup> except the working conditions that were measured with DWECS-based JEMs.<sup>3</sup>

### Statistical analysis

Using Cox regression, we estimated HRs and 95% CIs for the association between medium-low, medium-high and high emotional demands compared with low emotional demands at baseline and incident disability pension during follow-up. We censored due to early and statutory retirement, emigration, death or end of study, whichever came first.

We fitted three models with estimates incrementally adjusted for sex and age (model 1), cohabitation, migration background, and household disposable income (model 2), and the four other working conditions (model 3). We conducted a supplementary analysis with adjustment for LTSA in the 24 months before baseline, although LTSA might be a mediator rather than a confounder for the association between emotional demands and disability pension.

We added two post hoc analyses because estimates changed substantially from model 2 to model 3. First, we explored the relative contribution of each working condition to the change in the estimates by entering the four working conditions separately into model 3. Second, we explored the association of emotional demands within strata of high versus low levels of the other working conditions by dichotomising the working conditions by median split and repeating the analyses in the strata.

Visual inspection of survival curves did not indicate violations of the proportional hazards assumption (online supplemental material).

All analyses were conducted in SAS, V.9.4.

### RESULTS

During 15 649 743 person-years of follow-up, we identified 67 923 disability pension cases, 43.4 per 10 000 person-years (48.7 and 38.4 cases in women and men, respectively). The mean follow-up was 9.4 years.

We found a lower risk of disability pension for medium-low, medium-high and high emotional demands compared with low emotional demands in model 1 and model 2 (table 1).

**Table 1** Exposure to emotional demands in 2000 and risk of disability pension from 2001 to 2010

Emotional Demands	N	Person-years	Cases	Cases per 10 000 person-years	Model 1 HR, 95% CI	Model 2 HR, 95% CI	Model 3 HR, 95% CI
All	1 670 825	15 649 743	67 923	43.4			
High	417 663	3 930 006	18 989	48.3	0.76 (0.74 to 0.78)	0.86 (0.84 to 0.87)	1.73 (1.68 to 1.79)
Medium high	416 667	3 944 803	13 723	34.8	0.57 (0.56 to 0.58)	0.70 (0.68 to 0.71)	1.23 (1.20 to 1.27)
Medium low	419 311	3 894 792	16 942	43.5	0.80 (0.78 to 0.82)	0.86 (0.84 to 0.88)	1.20 (1.17 to 1.23)
Low	417 184	3 880 141	18 269	47.1	Reference	Reference	Reference
Women	809 416	7 616 373	37 099	48.7			
High	305 321	2 876 945	14 393	50.0	0.69 (0.67 to 0.71)	0.78 (0.75 to 0.81)	2.06 (1.95 to 2.18)
Medium high	240 324	2 298 373	9 743	42.4	0.57 (0.55 to 0.59)	0.68 (0.66 to 0.71)	1.54 (1.47 to 1.62)
Medium low	190 994	1 773 649	8 428	47.5	0.72 (0.69 to 0.75)	0.78 (0.76 to 0.81)	1.26 (1.21 to 1.31)
Low	72 777	667 406	4 535	67.9	Reference	Reference	Reference
Men	861 409	8 033 371	30 824	38.4			
High	112 342	1 053 061	4 596	43.6	0.85 (0.82 to 0.88)	0.97 (0.93 to 1.00)	1.52 (1.45 to 1.58)
Medium high	176 343	1 646 431	3 980	24.2	0.51 (0.50 to 0.53)	0.66 (0.64 to 0.69)	1.05 (1.01 to 1.09)
Medium low	228 317	2 121 144	8 514	40.1	0.85 (0.82 to 0.87)	0.89 (0.87 to 0.92)	1.22 (1.18 to 1.25)
Low	344 007	3 212 735	13 734	42.7	Reference	Reference	Reference

Model 1: Adjusted for sex and age. Model 2: Further adjusted for cohabitation, migration background and household disposable income after tax. Model 3: Further adjusted for physical workload, influence, possibilities for development and role conflicts.

After adjustment for physical workload, influence, possibilities for development and role conflicts (model 3), the estimates reversed and indicated an increasing risk of disability pension with increasing levels of emotional demands (HR of 1.20, 1.23 and 1.73 for medium-low, medium-high and high emotional demands, respectively, compared with low emotional demands).

In women, there was a clear exposure–response association with HRs of 1.26 (medium low), 1.54 (medium high) and 2.06 (high) in the most-adjusted model. In men, there was a tendency towards exposure–response associations (HRs of 1.22, 1.05 and 1.52).

Estimates for the complete main model and estimates adjusted for LTSA before baseline are provided in online supplemental material.

### Post hoc analyses

Adjustment for possibilities for development was the most important factor for reversing the estimates from model 2 to model 3, followed by influence and physical workload (data are available on request).

When we repeated the analyses stratified by high and low levels of the four other working conditions, we found that high emotional demands were associated with an increased risk of disability pension in all strata (data are available on request).

### DISCUSSION

In this nationwide cohort study including 1 670 825 employed individuals, we found an increased risk of permanent exit from the labour market due to disability pension in women and men working in emotionally demanding jobs. There was an exposure–response association in women and a tendency towards an exposure–response association in men. The increased risk of disability pension was observed after, but not before, adjusting for other working conditions, suggesting that the association between emotional demands and disability pension was masked by confounding by the other working conditions. Future studies should analyse if there is an interaction between emotional demands and other working conditions with regard to disability pension.

Our findings contrast with results from previous studies. Andersen *et al*<sup>6</sup> reported that high emotional demands were associated with a decreased risk of disability pension, after adjustment for physical exertion at work. However, the population consisted of only one job group, female eldercare workers and it is possible that the variation in emotional demands in the study did not reflect differences in working conditions but other factors (eg, perceptions or mood). Sundstrup *et al*<sup>5</sup> reported that emotional demands were associated with risk of disability pension in a population of older workers (mean age: 54.3 years) with an HR of 1.59 in a model that included adjustment for physical workload, however, not statistically significant (95% CI 0.92 to 2.77). If employees managed their jobs until mid-50s, it is conceivable that many would continue working until eligibility for early retirement, which may result in a low number of disability pension cases. Both earlier studies assessed emotional demands by self-report, making estimates vulnerable to reporting bias, whereas in our study the use of a JEM greatly reduced the possibility of reporting bias.

### Limitations

Application of JEMs may lead to exposure misclassification as JEMs disregard differences in exposure between employees

with identical occupational codes<sup>12</sup>; therefore, one should be cautious when interpreting results on the individual level. We cannot rule out residual confounding, for example, that health status has caused selection into certain jobs.

We followed participants no longer than 10 years because we were concerned about exposure misclassification in a longer follow-up. It is possible that the results from the study period (2000–2010) are not applicable to the contemporary Danish labour market. However, recent numbers of awarded disability pensions in Denmark are comparable to the study period.

As welfare and administrative systems differ between countries, generalisation of Danish research results to other countries should be done with caution.

### CONCLUSION

In this nationwide cohort study, we found an increased risk of permanent exit from the labour market due to disability pension in women and men working in emotionally demanding jobs.

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