

Among night shifters, those who perceived that they frequently had excess workload were 4.54 (1.03 – 20.00) times more likely to frequently experience physical symptoms.

**Conclusion** This study has shown that there is an association between specific occupation hazards and shiftwork with adverse physical health among Filipino female factory workers.

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#### OCCUPATIONAL MOVEMENTS AND POSTURES OF THE NECK AS RISK FACTORS FOR CERVICAL DISC HERNIATION (CDH).

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**Introduction** Some observational and in vivo studies suggest dynamic neck movements and positions as causes of cervical disc disease. However, epidemiological evidence using objective measurements on neck position and movements as exposure is limited.

**Objectives** We studied the associations between objectively measured occupational neck movements and postures and CDH.

**Methods** We formed a cohort of 852,625 Danish workers who ever held at least one of 29 jobs (e.g. dentists, hairdressers, childcare, carpenters) from 1981 to 2016. Representative whole work-day inclinometric measurements using triaxial accelerometers measuring neck angular velocity and posture of the neck were used as exposure. Job titles were retrieved from the Danish Occupational Cohort with eXposure data (DOC\*X) database. First diagnosis of CDH was retrieved from the Danish National Patient Register. The risk of CDH by quintiles of cumulated exposure was assessed by incidence rate ratios (IRR), adjusted for age, sex, calendar -year, previous lumbar disc herniation and education, using Poisson regression models.

**Results** We found 14,000 cases of CDH during 20.2 million person-years of follow-up. Crude analyses showed an increasing IRR of CDH with increasing angular velocity of the neck. However, in the fully adjusted model increasing levels of neck angular velocity showed a decreasing risk with IRR 0.90 [95% confidence interval (CI) 0.86–0.95] when the highest quintile (dynamic work) was compared to the lowest (static work). Similar results were found for extension and flexion of the neck. Multiple sensitivity analyses did not change the results.

**Conclusion** In this large register-based study, we found no evidence of an increased risk of CDH in jobs with high velocity of movements or extreme positions of the neck. Other factors than dynamic neck movements and bent neck position seem to be important in the development of CDH.

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#### REPETITIVE AND FORCEFUL MOVEMENTS OF THE HAND AS PREDICTORS FOR PAIN IN THE DISTAL UPPER EXTREMITIES

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**Introduction** Some evidence exists of an association between measures of occupational use of hand force and repetition and

tendinitis of the wrist and epicondylitis of the elbow. However, these studies have often been limited by bias because of self-reported exposure and an outcome sensitive to time fluctuations.

**Objectives** To investigate occupational repetitive movements and the use of hand force as causes of distal upper extremities musculoskeletal disorders (D-UEMSD).

**Methods** A cohort of 202,735 workers in a private pension health scheme from 2005 to 2017 in one of 17 jobs (e.g. office work, carpentry, cleaning) was formed. Representative electro-goniometric measurements of wrist angular velocity as a measure for repetition and expert-rated use of hand force were used as exposures. Job titles were retrieved from the Danish Occupational Cohort with eXposure data (DOC\*X) database. Outcome was first treatment for D-UEMSD. In a Poisson regression model, the incidence rate ratios (IRRs) of D-UEMSD were adjusted for age, calendar-year, diagnosis of rheumatoid arthritis and arm fractures. In further analyses, wrist velocity or hand force was added.

**Results** In men, wrist velocity had an IRR of 1.48 (95%CI 1.15–1.91) when the highest exposure level was compared to the lowest but with no clear exposure-response pattern. The effect became insignificant when adjusted for hand force. Hand force had an IRR of 2.65 (95%CI 2.13–3.29) for the highest vs. the lowest exposure with an exposure-response pattern, which remained after adjustment for wrist velocity. Among women, no increased risk was found for hand force, while wrist velocity showed a significantly protective association with D-UEMSD.

**Conclusions** In men, occupational exposure to hand force more than doubled the risk of seeking treatment for D-UEMSD. The results for exposure to repetition were less clear. In women, we could not find any indications of an increased risk neither for force nor repetition.

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#### PROSPECTIVE ASSOCIATIONS OF MULTIPLE EXPOSURES TO PSYCHOSOCIAL WORK FACTORS WITH WELL-BEING AMONG EMPLOYEES IN FRANCE

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**Objective** Literature reviews showed adverse effects of high job demands, low job control, and low social support at work on well-being in working populations. Other psychosocial work factors (PWFs) remain understudied in association with well-being. We aimed to examine the prospective associations of a large variety of PWFs and other occupational exposures with poor well-being, as evaluated by the WHO-5 well-being index. An additional objective was to explore the effects of multiple occupational exposures on this outcome.

**Methods** The study sample consisted of 15776 employees aged 15–65 years (9181 women, 8579 men) included in the representative sample of the French national survey on working conditions and followed up from 2013 to 2016. Participants were classified as having poor well-being if they had a WHO-5 score below 13. Occupational exposures included 20 PWFs which were studied separately and then grouped into five dimensions (work demands, work organization and job content, interpersonal relations and leadership, work-individual interface, workplace violence), 4 factors related to working

time/hours, and 4 physico-chemical exposures. Weighted robust Poisson regression models were used to investigate the associations between occupational exposures in 2013 and incident poor well-being in 2016 after adjustment for covariates, in men and women separately.

**Results** The incidence rate of poor well-being in 2016 was 10.3% among men and 16.8% among women. Significant prospective associations were found between a wide range of PWFs and poor well-being, and the risk increased with the number of these factors globally and within almost all psychosocial dimensions (except work demands in men and workplace violence in both genders). Among the other studied occupational exposures, noise was prospectively associated with poor well-being in women.

**Conclusion** Working conditions, especially PWFs, could have a negative impact on well-being and exposure to multiple PWFs could increase the risk of poor well-being still further.

**P-53** **MULTIPLE EXPOSURES TO OCCUPATIONAL FACTORS AND SLEEP PROBLEMS AMONG EMPLOYEES IN FRANCE**

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**Objective** Many studies suggest that working conditions may have an impact on health, including sleep. One of the main limitations in the literature, however, is that studies have explored a limited number of occupational exposures and have not addressed the issue of multiple exposures. Our objective was to study the associations of a large variety of occupational exposures with sleep problems, and to assess the impact of multiple occupational exposures on this outcome.

**Methods** The study sample consisted of 20430 employees aged 15–65 years (8579 men, 11851 women) included in the representative sample of the working population from the 2016 French national survey on working conditions. Participants were classified as having sleep problems if they reported sleep disturbances and/or sleep medication, at least several times a week. Occupational exposures were: 21 psychosocial work factors (PWFs) further grouped in five dimensions (work demands, work organization and job content, interpersonal relations and leadership, work-individual interface, workplace violence), four working time/hours factors and four physico-chemical exposures. Weighted robust Poisson regressions were performed to study the associations between occupational exposures and sleep problems after adjustment for covariates, in men and women separately.

**Results** Among the studied working time/hours factors, only night work among women was associated with sleep problems, while most of psychosocial work factors and physico-chemical exposures were significantly associated with sleep problems. Stronger exposure-outcome associations were found in men for some PWFs. The odds of sleep problems increased with increasing number of exposures for most dimensions of PWFs, and with increasing number of physico-chemical exposures (non-significant trend in women).

**Conclusion** Psychosocial and physico-chemical exposures were found to be associated with sleep problems, and the higher the number of exposures, the higher the odds of sleep problems. More studies are needed on multiple occupational

exposures in association with sleep problems among working populations.

**P-54** **MULTIPLE EXPOSURE TO PSYCHOSOCIAL FACTORS AT WORK AND OTHER OCCUPATIONAL FACTORS AND COMMON MENTAL DISORDERS AMONG EMPLOYEES IN FRANCE**

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**Objective** Knowledge on the cumulative effects of psychosocial work factors on mental health is sparse, and other occupational exposures such as those from the physical work environment remain understudied in this topic. Therefore, this study aimed to examine the associations between various types of occupational factors, including a large variety of psychosocial work factors (PWFs), and major depressive episode (MDE) and generalized anxiety disorder (GAD) in the French working population.

**Methods** The study was based on data from the 2016 national survey on working conditions conducted on a representative sample of workers, including 20430 employees aged 15–65 years (8579 men, 11851 women). The MINI standardized diagnostic interview was used to assess MDE and GAD. The following occupational exposures were studied: 21 PWFs grouped in five dimensions (work demands, work organization and job content, interpersonal relations and leadership, work-individual interface, workplace violence), four working time/hours factors and four physico-chemical exposures. The associations between occupational exposures and MDE/GAD were assessed in each gender separately using weighted logistic regression models.

**Results** We found a higher prevalence of MDE and GAD among women than among men (8.6% and 8.7% respectively versus 4.3% and 4.6%). There were significant associations between most psychosocial work factors, and MDE and/or GAD. The odds of MDE/GAD increased with the number of exposures for all psychosocial dimensions, except workplace violence. The odds of MDE also increased with multiple physico-chemical exposures. No association was found between working time/hours factors and MDE/GAD, except between unsocial work days, shift work and MDE in women.

**Conclusion** Our results highlighted the negative impact of being exposed to multiple PWFs for depression and anxiety, and showed a cumulative association of the four studied physico-chemical exposures with depression. More research is needed on the effect of the accumulation of occupational exposures on these outcomes in working populations.

**P-60** **RELATIONS BETWEEN WORK-RELATED FACTORS AND STRESS AND INJURY AMONG JANITORS**

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**Introduction** While a body of literature identifies relations between injury occurrence and resulting stress, literature