Bullying/Stress/Violence

EFFECTIVENESS OF ORGANIZATIONAL INTERVENTIONS TO PREVENT OCCUPATIONAL BURNOUT: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Objectives To assess the efficacy of organizational interventions on primary and secondary prevention of occupational burnout.

Methods We searched in PubMed, EMBASE, PsycINFO, and Cochrane Library databases (since inception until the 31.05.2022) experimental or quasi-experimental controlled studies that reported the effect of preventive intervention on organizational or combined level on occupational burnout. We used Cochrane Collaboration's tool for randomized and non-randomized interventions to assess the risk of bias. Studies reporting emotional exhaustion score mean before and after intervention in both treatment and control groups were meta-analysed using the random-effect model. The effect size was estimated as Morris (2008) dpc2.

Results From the 2425 identified records, we assessed 228 full texts for eligibility and included 23 studies. Among them, four implemented combined and 19 organizational interventions. The latter were either participatory interventions (n=13) or focused on workload (n=4) and work-schedule (n=5), or other. The risk of bias was low in seven studies, high in another seven studies, and unclear otherwise. Eleven studies were included in meta-analysis. Overall, the meta-estimate of dpc2 was -0.33 (95%-CI=-0.41;0.26). Interventions focused on workload and participatory interventions had a stronger effect, while interventions focused on work schedule had no effect. The effect-size varied by the follow-up duration.

Conclusion Interventions at organizational level in workplaces can prevent or reduce burnout. Several types of interventions showed a moderate effect on emotional exhaustion. However, the evidence is still limited, due to a small number of studies and a high heterogeneity between them. This calls for further research, using participatory interventions at organizational level, especially in sectors with high risk of stress and burnout.

Specific occupations/Industries

CHANGES IN WORK AND HEALTH CONDITION IN SWISS BUS DRIVERS FROM 2010 THROUGH 2022

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Introduction For the past decades, bus drivers (BDs) have been considered as one of the most exposed and diseased occupational groups worldwide. This study aimed to assess and compare the prevalence of the health problems and BDs’ working conditions in 2010, 2018, and 2022.

Material and Methods This repeated cross-sectional study was conducted among BDs affiliated to a union active in public road transport sector. We reused self-administered questionnaire data to estimate prevalence of musculoskeletal, digestive and mental disorders, and accidents. Regarding working conditions, we measured the score of twelve drudgery factors at three time points.

For health problems and accidents, which increased between 2010 and 2022, we performed logistic regression models adjusted for sex, age, driving seniority, region, education and occupancy rate.

Results The study sample included 698 participants in 2010, 375 in 2018 and 870 in 2022. The most prevalent health conditions were back and shoulder and neck pain, abnormal fatigue. While the three most tedious work conditions were working day of more than 10 hours, cyclists’ behavior, and long period without access to toilets.

Shoulder and neck pain was associated with female sex, upper limb muscular pain, and driving for more than 4h. Sleep disorders were associated to region, union, education, anxiety, stomach pain, fatigue, sick leave, aggressiveness of other road users and cyclists’ behavior. Sick leaves were associated to age, driving seniority, region, union, stress, anxiety, sleep disorder, and accidents. Finally, accidents were associated to region, apprenticeship and sick leaves in the last 6 months.

Conclusion The female proportion of bus drivers’ work force has increased 4-fold over the last decade. Furthermore, some working conditions as driving period of more than 4 hours have worsened, explaining partly the worsening of BDs’ health condition. The understanding of working conditions is essential to prevent occupational diseases in BDs.

Carcinogens/Cancer

COHORT STUDY OF WORKERS IN THE UK GLASS-REINFORCED PLASTICS MANUFACTURING INDUSTRY

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Introduction Potentially high occupational exposures to styrene occur, largely in the absence of other chemicals, in the manufacture of glass-reinforced products. Styrene is also present in air pollution and tobacco smoke. The Health and Safety Executive’s (HSE) styrene cohort was previously included in an international pooled cohort study coordinated by the International Agency for Research on Cancer (IARC). An update to this study is currently being coordinated by researchers at Aarhus University. This update will include an updated exposure assessment. In 2019, IARC published its updated evaluation of the carcinogenicity of styrene and styrene-7,8-oxide, a metabolite of styrene in humans. IARC concluded that both agents were probably carcinogenic to humans (Group 2A).

The HSE cohort has never been separately analysed. It is only a small cohort (c 1800 participants), but it has long follow-up. It will contribute to the updated international study. Primary interest is in haematopoietic cancers, although other cancer sites such as oesophagus, nose and nasal cavities and lung are of interest too.

Materials and Methods Research governance clearances were obtained from NHS Ethics, HRA Confidentiality Advisory Group and NHS Digital IGARD. Work is currently underway...
to obtain mortality and cancer registration data for the cohort. The intention is to produce SMRs and SIRs and, where sufficient number of events allow, subanalyses including by cumulative exposure will be undertaken.

**Results & Conclusion** The international study will be statistically the most powerful study to have examined the carcinogenicity of styrene to date. As well as cohorts from the UK, the updated study will include cohorts from Denmark, Finland, Italy, Norway, Sweden and the USA.

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**Shift work**

**O-205 NIGHT SHIFT WORK AND SLEEP DEPRIVATION IN RELATION TO VACCINE INDUCED SARS-COV-2 ANTIBODY RESPONSES IN A GENERAL POPULATION COHORT (COVICAT STUDY)**

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**Introduction** Night shift work and sleep deprivation have been associated with lower antibody responses induced by vaccination against seasonal influenza, meningitis-C and hepatitis A. We examined the association of exposure to night shift work and sleep deprivation with antibody levels induced by COVID-19 vaccines.

**Materials and Methods** This study was nested in an ongoing population-based cohort in Catalonia, Spain. Blood samples were collected in 2021 from a random subsample of 1,090 participants. We measured 3 immunoglobulins (Ig)M, IgG, and IgA antibodies against 5 SARS-CoV-2 antigens, including RBD (receptor-binding domain), S (spike-protein), and S2 (subunit 2 from spike-protein). We collected data on night shift work (current night work, frequency, duration) and sleep metrics (sleep duration, sleep problems, changes in sleep duration since the beginning of the pandemic). We adjusted linear regression estimates (% change) for individual- and area-level covariates, time since vaccination, vaccine doses and type.

**Results** Participants’ mean age was 57.6 years, 57% were female, 73% received 2 vaccine doses (42% Pfizer, 44% AstraZeneca), 3.8% were current night workers and 36.5% of the sample reported sleep problems. No overall association pattern was observed between current night work and vaccine-induced antibody responses. IgG levels tended to be lower (differences in the range of 3.6–53.7%) among night workers, compared to day workers but differences were not statistically significant. Participants with short sleep (<6 hours) had significantly lower IgM antibody levels compared to those that reported 7 hours of sleep. No clear pattern was observed with sleep quality.

**Conclusions** Further research in larger studies is needed to evaluate the influence of night shift work and impaired sleep on vaccine induced immune responses and risk of breakthrough infections.

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**Musculoskeletal disorders**

**O-21 ASSOCIATION BETWEEN WORK ABILITY INDEX AND LOW BACK PAIN AMONG PRINTING WORKERS**

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**Introduction and Objectives** Low back pain is one of the most common musculoskeletal disorders and important causes of early retirement due to disability in employees in industrialized and developing countries. The present study aimed to determine the work ability index and its relationship with low back pain among employees of Tehran offset printing industry.

**Methods** A cross-sectional study was performed within six months in 2020. Data from 220 employers working in offset printing industry were collected through survey questionnaire including Nordic Musculoskeletal Questionnaires (NMQ) and Work Ability Index (WAI). Data analysis was performed using SPSS software version 24 with a significance level of P-Value <0.05.

**Results** In generally, more than half of the participants (62.5) indicated high symptoms of Low Back Pain. Also, the results of Pearson correlation test showed that there is a positive and significant correlation between level of work ability and severity of low back pain (p<0.001).

**Conclusion** Job analysis and identification and correction of work procedures that put the body position during work in hard and unconventional conditions and impose a lot of workloads on the back area can be effective in preventing low back pain in work environments.

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**Exposure assessment**

**O-212 APPLYING SENSORS FOR ASSESSMENT OF OCCUPATIONAL EXPOSURES IN EPIDEMIOLOGICAL STUDIES: EVALUATION OF SENSORS AND PRELIMINARY FINDINGS**

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**Introduction** Low cost sensors have potential for occupational exposure assessment by providing information on exposure profiles rather than time weighted averages (TWA). High resolution exposure data may advance our knowledge on how exposure patterns may affect (acute) health. We aimed to