



This Workplace Research Monthly includes the latest peer-reviewed articles, reports and evidence on a range of workplace health and safety, prevention, recovery at work and return to work topics that were published in July 2023 only.

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## Description of Evidence Levels Definitions Used in this Review

1. **Level of Evidence** – Certain study designs are scientifically stronger at answering a question. The scoring hierarchy we provided is presented below.

Level of Evidence	Description
Level 1	Evidence from a systematic review or meta-analysis of relevant studies.
Level 2	Evidence from a randomised controlled trial
Level 3	Evidence from a controlled intervention trial without randomisation (i.e. quasi-experimental).
Level 4	Evidence from a case-control or cohort study.
Level 5	Evidence from a single case study, a case series, or qualitative study.
Level 6	Evidence from opinion pieces, reports of expert committees and/or from literature reviews (scoping or narrative).

2. **Relevance** – Research carried out in Australia or similar countries is most relevant to Australian readers.

Level	Description
A	Study conducted in Australia or the study has been conducted outside Australia but confounders unlikely to affect relevance
B	Study conducted outside Australia and confounders likely to affect generalisability

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## Enabling Healthy and Safe Workplaces

### Health and Wellbeing

*This month we explore the relationships between health literacy at work and employee wellbeing, work productivity and disorders of gut-brain interaction, workplace socioeconomic characteristics and coronary heart disease, educational level and working life expectancy, and oral health and work problems. In other studies, we explore health issues associated with smokers at work and self-awareness among working autistic young adults.*

#### **Survey of smokers among workers at one facility: A cross-sectional study with propensity score matching.**

**Background:** Smoking has been reported to be a risk factor for a variety of diseases. In Japan, the Brief Job Stress Questionnaire (BJSQ) has been administered by the Ministry of Health, Labour and Welfare since December 2015, but few reports have focused on its relationship with smoking. We investigated the current situation of smokers among staff of Kagoshima University who underwent a medical check-up.

**Patients and methods:** Of 2,478 people who underwent a medical check-up in May and June 2021, we targeted 2,237 workers who reported whether they smoked. We examined results of the medical check-up and BJSQ and the background of smokers (n=139, 6.2%). We compared smokers and non-smokers (n=2,098) using propensity score matching (PSM) for sex, age, drinking habits, medication for dyslipidaemia, and overtime working hours at a 1:1 ratio. **Results:** The results showed that white blood cell count (p=0.044), platelet count (p<0.001), glutamyl transferase (p=0.023), and triglyceride (p=0.027) were significantly higher among current smokers in comparison with current non-smokers. Smokers reported significantly more stress than non-smokers in terms of social support (p=0.027). **Conclusion:** As a result of PSM, several blood test items related to non-communicable diseases (lifestyle-related diseases) showed high values in current smokers, and these individuals reported significantly more stress than non-smokers. According to the emphasis on group analysis in the Total Health Promotion Plan revised in 2020, our findings can be helpful in enhancing smoking cessation programs in the workplace.

**Komaki et al. 2023.**

**In Vivo, vol. 37, no. 4.**

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**Keywords:** Brief Job Stress Questionnaire; group analysis; propensity score matching; smoking.

**Evidence Level:** 4B

**Link:** <https://iv.iijournals.org/content/37/4/1873.long>

#### **Health literacy at work - individual and organizational health literacy, health supporting leadership and employee wellbeing.**

**Background:** Against the backdrop of demographic change and the shortage of skilled workers, employees' psychological wellbeing is of special interest for employers. In previous studies, individual health literacy has already been positively associated with psychological wellbeing. However, in order to improve health literacy, it is essential to take into account both the individual prerequisites and the demands and complexity of the system in which individuals operate. As current studies primarily focus on employees' individual health literacy and as the concept of organizational health literacy, so far, is mainly used in the context of health care institutions, this study investigates on the impact of organizational health literacy and health supporting leadership on the relationship between individual health literacy and employees' psychological wellbeing in a big German company based in the financial sector. **Methods:** Data of an employee survey that was conducted in a big German company of the financial sector in October 2021 were analyzed by two mediation analyses using the PROCESS macro by Hayes for SPSS. A total of 2555 employees was included in analyses (51.4% male and 48.6% female). **Results:** The relationship between individual health literacy and employees' psychological wellbeing is partially mediated by organizational health literacy, indirect effect ab 0.268 - CI [0.170, 0.378] and by health supporting leadership, indirect effect ab 0.228 - CI [0.137, 0.329]. **Conclusion:** Study results provide new indications for planning and evaluating the health strategy of companies. Regarding the psychological wellbeing of employees,

practitioners and researchers should focus not only on individual health literacy but also on organizational health literacy and health supporting leadership.

**Lindert et al. 2023.**

**BMC Health Services Research, vol. 23, no. 1.**

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**Keywords:** Employee health; leadership behavior; mental health; occupational health.

**Evidence Level:** 4B

**Link:** <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-023-09766-0>

### **Work productivity and activity impairment in disorders of gut-brain interaction: Data from the Rome Foundation Global Epidemiology Study.**

**Background:** Disorders of Gut-Brain Interaction (DGBI) are highly prevalent worldwide, but their effect on work productivity has not gained much attention. **Aims and methods:** We aimed to compare work productivity and activity impairment (WPAI) in persons with and without DGBI in a large population-based cohort and identify factors independently associated with WPAI in subjects with DGBI. Data were collected from Germany, Israel, Italy, Japan, the Netherlands, Poland, Spain and Sweden via Internet surveys as part of the Rome Foundation Global Epidemiology Study. Apart from the Rome IV diagnostic questionnaire, questionnaires evaluating WPAI related to general health (WPAI:GH), psychological distress (PHQ-4), somatic symptom severity (PHQ-15) and other factors were assessed. **Results:** Of the 16,820 subjects, 7111 met the criteria for DGBI according to the Rome IV diagnostic questionnaire. Subjects with DGBI were younger (median (interquartile range) age 43 (31-58) vs. 47 (33-62)) and more often female (59.0% vs. 43.7%) compared to subjects without DGBI. Subjects with DGBI had higher absenteeism, presenteeism (poor work productivity due to illness), overall work impairment and activity impairment ( $p < 0.001$ ) compared with subjects without. For subjects with DGBI affecting more than one anatomical region, WPAI was incrementally higher for each additional region. There were significant differences in WPAI for subjects with DGBI in different countries. Subjects from Sweden had the highest overall work impairment and from Poland the lowest. Using multiple linear regression, male sex, fatigue, psychological distress, somatic symptom severity and number of anatomical regions were independently associated with overall work impairment ( $p < 0.05$  for all). **Conclusion:** In the general population, people with DGBI have substantial WPAI compared with those without DGBI. The reasons for these findings should be explored further, but having multiple DGBI, psychological distress, fatigue and somatic symptom severity seem to contribute to this impairment associated with DGBI.

**Frändemark et al. 2023.**

**United European Gastroenterology Journal, vol. 11, no. 6.**

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**Keywords:** Rome Foundation; Rome IV criteria; activity impairment; fatigue; gut-brain axis; psychological distress; somatic symptom; work productivity.

**Evidence Level:** 4B

**Link:** <https://onlinelibrary.wiley.com/doi/10.1002/ueg2.12425>

### **Workplace socioeconomic characteristics and coronary heart disease: A nationwide follow-up study.**

**Background:** Important gaps in previous research include a lack of studies on the association between socioeconomic characteristics of the workplace and coronary heart disease (CHD). We aimed to examine two contextual factors in association with individuals' risk of CHD: the mean educational level of all employees at each individual's workplace (education<sub>work</sub>) and the neighbourhood socioeconomic characteristics of each individual's workplace (neighbourhood SES<sub>work</sub>). **Design:** Nationwide follow-up/cohort study. **Setting:** Nationwide data from Sweden. **Participants:** All individuals born in Sweden from 1943 to 1957 were included ( $n=1\ 547\ 818$ ). We excluded individuals with a CHD diagnosis prior to 2008 ( $n=67\ 619$ ), individuals without workplace information ( $n=576\ 663$ ), individuals lacking residential address ( $n=4139$ ) and individuals who had unknown parents ( $n=7076$ ). A total of 892 321 individuals were thus included in the study (426 440 men and 465 881 women). **Primary and secondary outcome measures:** The

outcome variable was incident CHD during follow-up between 2008 and 2012. The association between education<sub>work</sub> and neighbourhood SES<sub>work</sub> and the outcome was explored using multilevel and cross-classified logistic regression models to determine ORs and 95% CIs, with individuals nested within workplaces and neighbourhoods. All models were conducted in both men and women and were adjusted for age, income, marital status, educational attainment and neighbourhood SES<sub>residence</sub>. **Results:** Low (vs high) education<sub>work</sub> was significantly associated with increased CHD incidence for both men (OR 1.29, 95% CI 1.23 to 1.34) and women (OR 1.38, 95% CI 1.29 to 1.47) and remained significant after adjusting for potential confounders. These findings were not replicable for the variable neighbourhood SES<sub>work</sub>.

**Conclusions:** Workplace socioeconomic characteristics, that is, the educational attainment of an individual's colleagues, may influence CHD risk, which represents new knowledge relevant to occupational health management at workplaces.

**Forsberg et al. 2023.**

**BMJ Open, vol. 13, no. 7.**

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**Keywords:** Cardiology; public health; social medicine.

**Evidence Level:** 4B

**Link:** <https://bmjopen.bmj.com/content/13/7/e065285.long>

### **Knowing and accepting oneself: Exploring possibilities of self-awareness among working autistic young adults.**

**Background:** When researchers and professionals talk about autism, they commonly point out problems and risks with autism or being autistic. Several interventions are based on the idea of the problems and risks of autism. Another way of talking about autism is to point out autistic people's strengths and strategies which they use to handle barriers and problems in their lives in order to live good lives on their own terms. **Methods:** In this article, the researchers explore how autistic young adults formulate their own difficulties, strengths and support needs in order to get right support from support people. **Results and Conclusions:** To be able to formulate this, autistic people need to get to know oneself and one's own way of functioning. Autistic own self-knowledge must be central when formal support people, such as social workers, formulate support and interventions aimed at helping autistic people, in order for the support/intervention to be helpful.

**Bertilsdotter Rosqvist et al. 2023.**

**Autism, vol. 27, no. 5.**

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**Keywords:** Adults; autism; autistic-centred support; neurodiversity; self-awareness.

**Evidence Level:** 6A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10291373/>

### **Trends of healthy and unhealthy working life expectancy in Germany between 2001 and 2020 at ages 50 and 60: A question of educational level?**

**Background:** Extending the number of active working years is an important goal both for maintaining individual quality of life and safeguarding social security systems. Against this background, we examined the development of healthy and unhealthy working life expectancy (HWLE/UHWLE) in the general population and for different educational groups. **Methods:** The study is based on data from the German Socio-Economic Panel study, including 88 966 women and 85 585 men aged 50-64 years and covering four time periods (2001-05, 2006-2010, 2011-2015 and 2016-2020). Estimates of HWLE and UHWLE in terms of self-rated health (SRH) were calculated using the Sullivan's method. We adjusted for hours worked and stratified by gender and educational level. **Results:** Working-hours adjusted HWLE at age 50 increased in women and men from 4.52 years (95% CI 4.42 to 4.62) in 2001-2005 to 6.88 years (95% CI 6.78 to 6.98) in 2016-2020 and from 7.54 years (95% CI 7.43 to 7.65) to 9.36 years (95% CI 9.25 to 9.46), respectively. Moreover, UHWLE also rose with the proportion of working life spent in good SRH (health ratio) remaining largely stable. At age 50, educational differences in HWLE between the lowest and highest educational groups increased over time in women and in men from 3.72 to 4.99 years and from 4.06 to 4.40 years,

respectively. **Conclusions:** We found evidence for an overall increase but also for substantial educational differences in working-hours adjusted HWLE, which widened between the lowest and highest educational group over time. Our findings suggest that policies and health prevention measures at workplace should be more focused on workers with low levels of education in order to extend their HWLE.

**Sperlich et al. 2023.**

**Journal of Epidemiology and Community Health, vol. 77, no. 7.**

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**Keywords:** HEALTH status; public health; workplace.

**Evidence Level:** 4B

**Link:** <https://jech.bmj.com/content/77/7/430.long>

### **Association of oral health with various work problems: A cross-sectional study of Japanese workers.**

**Background:** Oral diseases affect quality of life and known to decrease productivity. We examined the impact of oral health status on various types of work problems. **Methods:** This cross-sectional study used data from an internet-based self-report questionnaire survey administered to workers in Japan. Responses to the questionnaire regarding seven types of oral health-related work problems (1. Stress; 2. Lack of focus; 3. Lack of sleep; 4. Lack of energy; 5. Lack of communication due to halitosis; 6. Lack of communication due to appearance; 7. Lack of ability due to dental-related pain) were investigated and statistically analyzed. Explanatory variables were self-reported oral health status, number of teeth, and gum bleeding. To examine the association of oral health with the presence of work problems, logistic regression analysis was used to estimate the odds ratio (OR) and 95% confidence interval (CI). Age, sex, educational attainment, income, the presence of diabetes, and industrial classifications were used as the covariates. **Results:** A total of 3,930 workers (mean age: 43.3 (SD = 11.7), 2,057 males and 1,873 females) were included. Overall, a total of 6.2% of workers reported having at least one oral health-related work problem in the past year, whereas 21.8% of those with poor self-reported oral health reported work problems. Workers with poor self-reported oral health were 3.58 (95% CI (1.70-7.56)) times higher odds of reporting work problems than those with excellent self-reported oral health. **Conclusions:** Oral health was found to be associated with various work problems. Oral health promotion policies are needed in the workplace.

**Shimada et al. 2023.**

**BMC Oral Health, vol. 23, no. 1.**

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**Keywords:** Epidemiology; logistic regression; oral health; presenteeism; QOL; work problems.

**Evidence Level:** 4B

**Link:** <https://bmcoralhealth.biomedcentral.com/articles/10.1186/s12903-023-03196-4>

## **Work Health and Safety**

*This month we explore the identification of safety behaviours in construction workers, participatory approaches to empower health workers, and occupational risks for infection with influenza A and B. In Covid related research, we explore occupation differences in work-related Covid mitigation strategies, the incidence and predictors of Covid infection in prison healthcare workers, and occupational Covid exposures and illnesses among workers in California.*

### **Study on the interaction behaviours identification of construction workers based on ST-GCN and YOLO.**

**Background:** The construction industry is accident-prone, and unsafe behaviours of construction workers have been identified as a leading cause of accidents. One important countermeasure to prevent accidents is monitoring and managing those unsafe behaviours. The most popular way of detecting and identifying workers' unsafe behaviours is the computer vision-based intelligent monitoring system. However, most of the existing research or products focused only on the workers' behaviours (i.e., motions) recognition, limited studies considered the interaction between man-machine, man-material or man-environments. Those interactions are very important for judging whether the workers' behaviours are safe or not, from

the standpoint of safety management. **Methods:** This study aims to develop a new method of identifying construction workers' unsafe behaviours, i.e., unsafe interaction between man-machine/material, based on ST-GCN (Spatial Temporal Graph Convolutional Networks) and YOLO (You Only Look Once), which could provide more direct and valuable information for safety management. In this study, two trained YOLO-based models were, respectively, used to detect safety signs in the workplace, and objects that interacted with workers. Then, an ST-GCN model was trained to detect and identify workers' behaviours. Lastly, a decision algorithm was developed considering interactions between man-machine/material, based on YOLO and ST-GCN results. **Results:** Results show good performance of the developed method, compared to only using ST-GCN, the accuracy was significantly improved from 51.79% to 85.71%, 61.61% to 99.11%, and 58.04% to 100.00%, respectively, in the identification of the following three kinds of behaviours, throwing (throwing hammer, throwing bottle), operating (turning on switch, putting bottle), and crossing (crossing railing and crossing obstacle). **Conclusions:** The findings of the study have some practical implications for safety management, especially workers' behaviour monitoring and management.

**Li et al. 2023.**

**Sensors, vol. 23, no. 14.**

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**Keywords:** OpenPose; ST-GCN; YOLO; construction workers; interaction behaviors identification.

**Evidence Level:** 5B

**Link:** <https://www.mdpi.com/1424-8220/23/14/6318>

#### **Incidence and predictors of COVID-19 infection in prison healthcare workers.**

**Background:** The aim of the study is to assess the predictors of SARS-CoV-2 infection among correctional healthcare workers (HCWs). **Methods:** We conducted a retrospective chart review to describe the demographic and workplace characteristics of New Jersey correctional HCWs between March 15, 2020, and August 31, 2020, using univariate and multivariable analysis. **Results:** Among 822 HCWs, patient-facing staff had the highest incidence of infection (7.2%). Associated risk factors include being Black and working in a maximum-security prison. There were few statistically significant findings due to small total numbers (n = 47) that tested positive. **Conclusions:** Correctional HCWs' challenging work environment creates unique risk factors for infection with the SARS-CoV-2 virus. Administrative measures taken by the department of corrections may have a significant role in curbing the spread of infection. The findings can help focus preventive measures for reducing the spread of COVID-19 in this unique population.

**Caruth et al. 2023.**

**Journal of Occupational and Environmental Medicine, vol. 65, no. 7.**

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**Keywords:** COVID-19; infection; prison; healthcare workers.

**Evidence Level:** 4B

**Link:**

[https://journals.lww.com/joem/Abstract/2023/07000/Incidence\\_and\\_Predictors\\_of\\_COVID\\_19\\_Infection\\_in.7.aspx](https://journals.lww.com/joem/Abstract/2023/07000/Incidence_and_Predictors_of_COVID_19_Infection_in.7.aspx)

#### **Occupational COVID-19 exposures and illnesses among workers in California - Analysis of a new occupational COVID-19 surveillance system.**

**Background:** Little is known about occupational SARS-CoV-2 exposures and COVID-19 outcomes. **Methods:** We established a Doctor's First Reports of Occupational Injury or Illness (DFR)-based surveillance system to study cases of work-related COVID-19 exposures and disease. The surveillance data included demographics, occupation, industry, exposure, and illness, details including hospitalization and lost work. We classified workers into 'healthcare', non-healthcare 'public-facing', or 'other' worker groups, and rural-urban commuting areas (RUCAs). We describe worker exposures and outcomes overall by worker group and RUCA. We analyzed 2848 COVID-19 DFRs representing workers in 22 detailed occupation groups and 19 industry groups. **Results:** Most DFRs were for workers in metropolitan RUCAs (89%) and those in healthcare (42%) and public-facing (24%) worker groups. While DFRs were from 382 unique worksites, 52% were from

four hospitals and one prison. Among 1063 DFRs with a suspected exposure, 73% suspected exposure to a patient or client. Few DFRs indicated hospitalization (3.9%); however, the proportion hospitalized was higher among nonmetropolitan (7.4%) and public-facing (6.7%) workers. While 56% of DFRs indicated some lost work time, the proportion was highest among public-facing (80%) workers. Healthcare and prison workers were the majority of reported occupational COVID-19 exposures and illnesses. **Conclusions:** The risk of COVID-19 hospitalization and lost work may be highest among nonmetropolitan and public-facing workers.

**Bui et al. 2023.**

**International Journal of Environmental Research and Public Health, vol. 20, no. 13.**

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**Keywords:** COVID-19; SARS-CoV-2; occupational health; surveillance; workers.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/20/13/6307>

### **Occupational risks for infection with influenza A and B: A national case-control study covering 1 July 2006-31 December 2019.**

**Background:** We investigated whether crowded workplaces, sharing surfaces and exposure to infections were factors associated with a positive test for influenza virus. **Methods:** We studied 11 300 cases with a positive test for influenza A and 3671 cases of influenza B from Swedish registry of communicable diseases. Six controls for each case were selected from the population registry, with each control being assigned the index date of their corresponding case. We linked job histories to job-exposure matrices (JEMs), to assess different transmission dimensions of influenza and risks for different occupations compared with occupations that the JEM classifies as low exposed. We used adjusted conditional logistic analyses to estimate the ORs for influenza with 95% CI. **Results:** The highest odds were for influenza were: regular contact with infected patients (OR 1.64, 95% CI 1.54 to 1.73); never maintained social distance (OR 1.51, 95% CI 1.43 to 1.59); frequently sharing materials/surfaces with the general public (OR 1.41, 95% CI 1.34 to 1.48); close physical proximity (OR 1.54, 95% CI 1.45 to 1.62) and high exposure to diseases or infections (OR 1.54, 95% CI 1.44 to 1.64). There were small differences between influenza A and influenza B. The five occupations with the highest odds as compared with low exposed occupations were: primary care physicians, protective service workers, elementary workers, medical and laboratory technicians, and taxi drivers. **Conclusions:** Contact with infected patients, low social distance and sharing surfaces are dimensions that increase risk for influenza A and B. Further safety measures are needed to diminish viral transmission in these contexts.

**Torén et al. 2023.**

**Occupation and Environmental Medicine, vol. 80, no. 7.**

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**Keywords:** Epidemiology; health personnel; microbiology; occupational health; respiratory System.

**Evidence Level:** 5B

**Link:** <https://oem.bmj.com/content/80/7/377.long>

### **A systematic review of participatory approaches to empower health workers in low - and middle-income countries, highlighting health workers for change.**

**Background:** This systematic review assesses participatory approaches to motivating positive change among health workers in low- and middle-income countries (LMICs). The mistreatment of clients at health centres has been extensively documented, causing stress among clients, health complications and even avoidance of health centres altogether. Health workers, too, face challenges, including medicine shortages, task shifting, inadequate training and a lack of managerial support. Solutions are urgently needed to realise global commitments to quality primary healthcare, country ownership and universal health coverage.

**Methods:** This review searched 1243 titles and abstracts, of which 32 were extracted for full text review using a published critical assessment tool. **Results:** Eight papers were retained for final review, all using a single methodology, 'Health Workers for Change' (HWFC). The intervention was adapted to diverse



geographical and health settings. Nine indicators from the included studies were assessed, eliciting many common findings and documenting an overall positive impact of the HWFC approach. Health workers acknowledged their negative behaviour towards clients, often as a way of coping with their own unmet needs. In most settings they developed action plans to address these issues.

**Conclusions:** Recommendations are made on mainstreaming HWFC into health systems in LMICs and its potential application to alleviating stress and burnout from COVID-19.

**Olude et al. 2023.**

**International Health, vol. 15, no. 4.**

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**Keywords:** LMICs; empowerment; health workers; motivation; participatory approaches; positive change.

**Evidence Level:** 1A

**Link:** <https://academic.oup.com/inthealth/article/15/4/462/6812847?login=true>

### **Between-occupation differences in work-related COVID-19 mitigation strategies over time: Analysis of the Virus Watch Cohort in England and Wales.**

**Background:** COVID-19 mitigations have had a profound impact on workplaces, however, multisectoral comparisons of how work-related mitigations were applied are limited. This study aimed to investigate (i) occupational differences in the usage of key work-related mitigations over time and (ii) workers' perceptions of these mitigations. **Methods:** Employed/self-employed Virus Watch study participants (N=6279) responded to a mitigation-related online survey covering the periods of December 2020-February 2022. Logistic regression was used to investigate occupation- and time-related differences in the usage of work-related mitigation methods. Participants' perceptions of mitigation methods were investigated descriptively using proportions. **Results:** Usage of work-related mitigation methods differed between occupations and over time, likely reflecting variation in job roles, workplace environments, legislation and guidance. Healthcare workers had the highest predicted probabilities for several mitigations, including reporting frequent hand hygiene [predicted probability across all survey periods 0.61 (95% CI 0.56-0.66)] and always wearing face coverings [predicted probability range 0.71 (95% CI 0.66-0.75) - 0.80 (95% CI 0.76-0.84) across survey periods]. There were significant cross-occupational trends towards reduced mitigations during periods of less stringent national restrictions. The majority of participants across occupations (55-88%) agreed that most mitigations were reasonable and worthwhile even after the relaxation of national restrictions; agreement was lower for physical distancing (39-44%). **Conclusions:** While usage of work-related mitigations appeared to vary alongside stringency of national restrictions, agreement that most mitigations were reasonable and worthwhile remained substantial. Further investigation into the factors underlying between-occupational differences could assist pandemic planning and prevention of workplace COVID-19 transmission.

**Beale et al. 2023.**

**Scandinavian Journal of Work, Environment and Health, vol. 49, no. 5.**

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**Keywords:** COVID-19; mitigation strategies; occupation.

**Evidence Level:** 4B

**Link:** <https://www.sjweh.fi/article/4092>

### **Risk Assessment**

*This month we explore clinical data analysis for prediction of coal workers' pneumoconiosis, testicular germ cell tumor risk by occupation and industry, and the intra-urban risk of occupational injuries and illnesses associated with current and projected climate.*

### **Efficient clinical data analysis for prediction of coal workers' pneumoconiosis using machine learning algorithms.**

**Background:** The purpose of this study is to propose an efficient coal workers' pneumoconiosis (CWP) clinical prediction system and put it into clinical use for clinical diagnosis of pneumoconiosis.

**Methods:** Patients with CWP and dust-exposed workers who were enrolled from August 2021 to December 2021 were included in this study. Firstly, we chose the embedded method through using three feature selection approaches to perform the prediction analysis. Then, we performed the machine learning algorithms as the model backbone and combined them with three feature selection methods, respectively, to determine the optimal predictive model for CWP. **Results:** Through applying three feature selection approaches based on machine learning algorithms, it was found that AaDO<sub>2</sub> and some pulmonary function indicators played an important role in prediction for identifying CWP of early stage. The support vector machine (SVM) algorithm was proved as the optimal machine learning model for predicting CWP, with the ROC curves obtained from three feature selection methods using SVM algorithm whose AUC values of 97.78%, 93.7%, and 95.56%, respectively. **Conclusion:** We developed the optimal model (SVM algorithm) through comparisons and analyses among the performances of different models for the prediction of CWP as a clinical application.

**Dong et al. 2023.**

**The Clinical Respiratory Journal, vol. 17, no. 7.**

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**Keywords:** Coal workers' pneumoconiosis clinical prediction; feature selection; machine learning.

**Evidence Level:** 5B

**Link:** <https://onlinelibrary.wiley.com/doi/10.1111/crj.13657>

**Testicular germ cell tumour risk by occupation and industry: A French case-control study – TESTIS.**

**Background:** Testicular germ cell tumours (TGCT) are the most common cancer in men of working age and its incidence has increased notably over the past 40 years. Several occupations have been identified as potentially associated with TGCT risk. The aim of this study was to further explore the relationship between occupations, industries and TGCT risk in men aged 18-45 years. **Methods:** The TESTIS study is a multicenter case-control study conducted between January 2015 and April 2018 in 20 of 23 university hospital centers in metropolitan France. A total of 454 TGCT cases and 670 controls were included. Full job histories were collected. Occupations were coded according to the International Standard Classification of Occupation 1968 version (ISCO-1968) and industry according to the 1999 version of Nomenclature d'Activités Française (NAF-1999). For each job held, ORs and 95% CIs were estimated using conditional logistic regression.

**Results:** A positive association was observed between TGCT and occupation as agricultural, animal husbandry worker (ISCO: 6-2; OR 1.71; 95% CI (1.02 to 2.82)), as well as salesman (ISCO: 4-51; OR 1.84; 95% CI (1.20 to 2.82)). An increased risk was further observed among electrical fitters and related, electrical and electronics workers employed for 2 years or more (ISCO: 8-5; OR<sub>≥2 years</sub> 1.83; 95% CI (1.01 to 3.32)). Analyses by industry supported these findings. **Conclusions:** Our findings suggest that agricultural, electrical and electronics workers, and salesmen workers experience an increased risk of TGCT. Further research is needed to identify the agents or chemicals in these high-risk occupations which are relevant in the TGCT development. **Trial registration number:** [NCT02109926](https://clinicaltrials.gov/ct2/show/study/NCT02109926).

**Guth et al. 2023.**

**Occupational and Environmental Medicine, vol. 80, no. 7.**

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**Keywords:** Epidemiology; medical oncology; occupational health; risk assessment.

**Evidence Level:** 5B

**Link:** <https://oem.bmj.com/content/80/7/407.long>

**Intra-urban risk assessment of occupational injuries and illnesses associated with current and projected climate: Evidence from three largest Australian cities.**

**Background:** Increased risk of occupational injuries and illnesses (OI) is associated with ambient temperature. However, most studies have reported the average impacts within cities, states, or provinces at broader scales. **Methods:** We assessed the intra-urban risk of OI associated with ambient temperature in three Australian cities at statistical area level 3 (SA3). We collected daily workers' compensation claims data and gridded meteorological data from July 1, 2005, to June 30, 2018. Heat index was used as the primary

temperature metric. We performed a two-stage time series analysis: we generated location-specific estimates using Distributed Lag Non-Linear Models (DLNM) and estimated the cumulative effects with multivariate meta-analysis. The risk was estimated at moderate heat (90th percentile) and extreme heat (99th percentile). Subgroup analyses were conducted to identify vulnerable groups of workers. Further, the OI risk in the future was estimated for two projected periods: 2016-2045 and 2036-2065. **Results:** The cumulative risk of OI was 3.4% in Greater Brisbane, 9.5% in Greater Melbourne, and 8.9% in Greater Sydney at extreme heat. The western inland regions in Greater Brisbane (17.4%) and Greater Sydney (32.3%) had higher risk of OI for younger workers, workers in outdoor and indoor industries, and workers reporting injury claims. The urbanized SA3 regions posed a higher risk (19.3%) for workers in Greater Melbourne. The regions were generally at high risk for young workers and illness-related claims. The projected risk of OI increased with time in climate change scenarios. **Conclusions:** This study provides a comprehensive spatial profile of OI risk associated with hot weather conditions across three cities in Australia. Risk assessment at the intra-urban level revealed strong spatial patterns in OI risk distribution due to heat exposure. These findings provide much-needed scientific evidence for work, health, and safety regulators, industries, unions, and workers to design and implement location-specific preventative measures.

**Fatima et al. 2023.**

**Environmental Research, vol. 228.**

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**Keywords:** Australia; climate change; DLNM; location-specific risk assessment; occupational injuries and illnesses.

**Evidence Level:** 4A

**Link:** <https://www.sciencedirect.com/science/article/pii/S0013935123006473?via%3Dihub>

## Chronic Health Issues

*This month we explore the workplace issues related to asthma, ADHD, chronic pain following a disabling work-related injury, and cancer. In other studies, we explore the relationship between chronic health issues and work functioning, and the inequalities on entering permanent paid employment.*

### **Impact of asthma on working life: An analysis of the French CONSTANCES cohort.**

**Background:** Asthma has significant occupational consequences. The objective of our study was to investigate the links between asthma and the career path, taking into account gender and age at asthma onset. **Methods:** Using cross-sectional data collected at inclusion in the French CONSTANCES cohort in 2013-2014, we studied the links between each career path indicator (number of job periods, total duration of employment, numbers of part-time jobs and work interruptions due to unemployment or health issues, employment status at inclusion) on the one hand, and current asthma and asthma symptom score in the last 12 months on the other hand, as reported by the participants. Multivariate analyses were performed separately for men and women using logistic and negative binomial regression models adjusted for age, smoking status, body mass index and educational level. **Results:** When the asthma symptom score was used, significant associations were observed with all of the career path indicators studied: a high symptom score was associated with a shorter total duration of employment as well as a greater number of job periods, part-time jobs and work interruptions due to unemployment or health issues. These associations were of similar magnitude in men and women. When current asthma was used, the associations were more pronounced in women for some career path indicators. **Conclusion:** The career path of asthmatic adults is more often unfavourable than that of those without asthma. Efforts should be made to support people with asthma in the workplace, in order to maintain employment and facilitate the return to work.

**Provost et al. 2023.**

**Occupational and Environmental Medicine vol. 80, no. 7.**

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**Keywords:** Asthma; epidemiology; occupational health.

**Evidence Level:** 4B

**Link:** <https://oem.bmj.com/content/80/7/392.long>

**Work-MAP telehealth metacognitive work-performance intervention for adults with ADHD: Randomized controlled trial.**

**Background:** The literature highlighted the need for evidence-based occupational therapy teleinterventions to improve work participation among adults with attention-deficit/hyperactivity disorder (ADHD).

**Methods:** This study aimed to assess the efficacy of a self-tailored, metacognitive, telehealth intervention to enhance the performance of adults with ADHD at work (Work-MAP). The outcome measures were efficacy and satisfaction with performing self-selected work goals, executive functions, and quality of life.

Participants in this randomized controlled trial were 46 adults with ADHD. **Results:** Group A ( $n = 31$ ) received the synchronous, hybrid-telehealth intervention in 11-weekly 1-hour individual sessions. Group B ( $n = 15$ ) completed the intervention after a waiting phase. Following the intervention, participants showed and maintained significant improvements in all outcome measures (strong-to-moderate significant effects) to the 3-month follow-up. **Conclusions:** The Work-MAP teleintervention appears effective for improving work participation (i.e., performance), executive functions, and quality of life of adults with ADHD.

**Grinblat et al. 2023.**

**Occupational Therapy Journal of Research, vol. 43, no. 3.**

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**Keywords:** Executive function; intervention; occupational performance; randomized controlled trial; work.

**Evidence Level:** 1A

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10336612/>

**Association of persistent pain with the incidence of chronic conditions following a disabling work-related injury.**

**Background:** In a cohort of workers disabled by a work-related injury or illness, this study aimed to: (i) compare pre-injury prevalence estimates for common chronic conditions to chronic condition prevalence in a representative sample of working adults; (ii) calculate the incidence of chronic conditions post-injury; and (iii) estimate the association between persistent pain symptoms and the incidence of common chronic conditions. **Methods:** Eighteen months post-injury, 1832 workers disabled by a work-related injury or illness in Ontario, Canada, completed an interviewer-administered survey. Participants reported pre- and post-injury prevalence of seven physician-diagnosed chronic conditions, and demographic, employment, and health characteristics. Pre-injury prevalence estimates were compared to estimates from a representative sample of workers. Multivariable logistic regression was used to examine the association of persistent pain with post-injury chronic condition incidence. **Results:** Age-standardized pre-injury prevalence rates for diabetes, hypertension, arthritis, and back problems were similar to prevalence rates observed among working adults in Ontario, while prevalence rates for mood disorder, asthma and migraine were moderately elevated. Post-injury prevalence rates of mood disorder, migraine, hypertension, arthritis, and back problems were elevated substantially in this cohort. High persistent pain symptoms were strongly associated with the 18-month incidence of these conditions. **Conclusions:** The incidence of five chronic conditions over an 18-month follow-up period post injury was substantial. Persistent pain at 18 months was associated with this elevated incidence, with population attributable fraction estimates suggesting that 37-39% of incident conditions may be attributed to exposure to high levels of persistent pain.

**Dobson et al. 2023.**

**Scandinavian Journal of Work, Environment and Health, vol. 49, no. 5.**

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**Keywords:** Pain; chronic; disability; work-related injury.

**Evidence Level:** 4B

**Link:** <https://www.sjweh.fi/article/4096>

### **Work functioning of Dutch workers with a chronic disease in early, mid and late working life: Cross-sectional findings from 38,470 participants in the Lifelines Cohort Study.**

**Background:** Insight into the work functioning of workers with chronic diseases may help to improve their sustainable employability. This study examines the work functioning of workers with cardiovascular disease (CVD), diabetes mellitus type 2 (DM2), chronic obstructive pulmonary disease (COPD), rheumatoid arthritis and depression across early, mid, and late working life. **Methods:** This cross-sectional study used data from 38,470 participants of the Dutch Lifelines study. Chronic diseases were classified based on clinical measures, self-reports, and medication. Work functioning was measured with the Work Role Functioning Questionnaire (WRFQ), covering work scheduling and output demands, physical demands, mental and social demands, and flexibility demands. Multivariable linear and logistic regression analyses were used to examine associations between chronic diseases and work functioning (continuous) and low work functioning (dichotomous). **Results:** Depression was associated with lower work functioning across all subscales and working life stages, with the lowest score in the work scheduling and output demands subscale in late working life (B:-9.51;95%CI:-11.4,-7.65). Rheumatoid arthritis was most strongly associated with lower work functioning in the physical demands subscale, with the lowest score in early working life (B:-9.97;95%CI:-19.0,-0.89). Associations between CVD and DM2 and work functioning were absent in early working life but present in mid and late working life. Associations between COPD and work functioning were absent in mid working life but present in late working life. **Conclusions:** Occupational health professionals could use the WRFQ to identify workers' perceived difficulties in meeting specific work demands, pointing out directions for interventions to mitigate perceived difficulties and thereby improve sustainable employability.

**Van Zon et al. 2023.**

**Preventative Medicine, vol. 172.**

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**Keywords:** Chronic disease; life stage; mental health; physical health; sustainable employment; work functioning.

**Evidence Level:** 4B

**Link:** <https://www.sciencedirect.com/science/article/pii/S0091743523001299?via%3Dihub>

### **Inequalities in the impact of having a chronic disease on entering permanent paid employment: A registry-based 10-year follow-up study.**

**Background:** This study aimed to investigate among unemployed persons (1) the impact of having a chronic disease on entering paid employment and obtaining a permanent contract and (2) whether these associations differed by educational attainment. **Methods:** Register data from Statistics Netherlands on employment status, contract type, medication and sociodemographic characteristics were linked. Dutch unemployed persons between 18 and 64 years (n=667 002) were followed up for 10 years (2011-2020). Restricted mean survival time analyses (RMSTs) were used to investigate differences in average months until entering paid employment and until obtaining a permanent contract between persons with and without cardiovascular diseases, inflammatory conditions, diabetes, respiratory illness, common mental disorders and psychotic disorders. Interaction terms were included for education. **Results:** One-third of the unemployed persons at baseline entered paid employment during follow-up. Persons with chronic diseases spent more months in non-employment compared with persons without chronic diseases (difference ranging from 2.50 months (95% CI 1.97 to 3.03 months) to 10.37 months (95% CI 9.98 to 10.77 months)), especially for persons with higher education. Conditional on entering paid employment, the time until a permanent contract was longer for persons with cardiovascular diseases (4.42 months, 95% CI 1.85 to 6.99 months), inflammatory conditions (4.80 months, 95% CI 2.02 to 7.59 months) and diabetes (8.32 months, 95% CI 4.26 to 12.37 months) than for persons without these diseases. These latter differences were similar across educational attainment. **Conclusions:** Having a chronic disease is a barrier to entering permanent paid employment. The findings underline the need to prevent chronic diseases and promote an inclusive workforce.

**van de Ven et al. 2023.**

**Journal of Epidemiology and Community Health, vol. 77, no. 7.**

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**Keywords:** Cardiovascular diseases; diabetes mellitus; employment; mental health; unemployment.

**Evidence Level:** 4B

**Link:** <https://jech.bmj.com/content/77/7/474.long>

### **The challenges of managing patients with cancer in the workplace: Needs, opportunities and perspectives of occupational physicians.**

**Background:** Cancer is a global major public health problem since it is a leading cause of death, accounting for nearly 10 million deaths in 2020 worldwide and the most recent epidemiological data suggested that its global impact is growing significantly. In this context, cancer survivors have to live for a long time often in a condition of disability due to the long-term consequences, both physical and psychological. These difficulties can seriously impair their working ability, limiting the employability. In this context, the occupational physician plays a key role in the implementation and enforcement of measures to support the workers affected by cancer, to address issues such as the information on health promotion, the analysis of work capacity and the management of disability at work and also promoting a timely and effective return to work and preserving their employability. **Methods:** Therefore, the aim of this study was to gather useful information to support the occupational physicians in the management of workers affected by cancer, through a survey on 157 Italian occupational physicians. **Results:** Based on the interviewees' opinions, the most useful occupational safety and health professionals in terms of job retention and preservation of workers affected by cancer are the employers and the occupational physicians themselves, whose role is crucial in identifying and applying the most effective reasonable accommodations that should be provided to the workers affected by cancer. The provision of these accommodations take place on the occasion of mandatory health surveillance medical examination to which the worker affected by cancer is subjected when he returns to work. Results on training and information needs showed that the management of the workers affected by cancer is essentially centered on an appropriate fitness for work judgment and on the correct performance of health surveillance. **Conclusions:** However, an effective and successful management model should be based on a multidisciplinary and integrated approach that, from the earliest stages of the disease, involves the occupational physicians and employers.

**Rondinone et al. 2023.**

**PLoS One, vol. 18, no. 7.**

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**Keywords:** Cancer; workplace; occupational physicians.

**Evidence Level:** 5B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0288739>

## **Occupational Exposure**

*This month we explore the issues associated with occupational exposure to benzene, cement dust, hexavalent chromium, respirable crystalline silica, bioaerosol, soluble platinum salts and excess noise.*

### **Benzene exposure assessment of printing workers treating petroleum-based cleaner in South Korea.**

**Background:** This study was conducted to check whether benzene is contained inside the petroleum-based cleaning agent used in the printing industry and measure whether it is actually exposed to the air.

**Methods:** Benzene was analyzed inside the cleaning agent and air exposure evaluation was done by area sampling. Risk assessment was performed using the Chemical Hazard Risk Management (CHARM) technique. **Results:** Most products contained benzene based on the results obtained from this study. As a result of collecting air samples and checking whether the workers were exposed to benzene actually, benzene was detected in three samples. As a result of the risk assessment, most of printing businesses scored more than four points. Benzene was detected in all petroleum-based cleaning products. In addition, benzene was detected in some of air samples. **Conclusions:** Considering the fact that even small exposure

level of benzene is dangerous to worker health and most of the printing businesses in South Korea operate on a small scale with fewer than five employees so the health management system is poor, it is necessary to prepare appropriate measures to prevent work diseases provoked by benzene exposure.

**Kim et al. 2023.**

**Industrial Health, vol. 61, no. 4.**

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**Keywords:** Benzene; exposure evaluation; petroleum-based cleanser; printing business; risk assessment.

**Evidence Level:** 5B

**Link:** [https://www.jstage.jst.go.jp/article/indhealth/61/4/61\\_2022-0103/article](https://www.jstage.jst.go.jp/article/indhealth/61/4/61_2022-0103/article)

### **Lung function and respiratory morbidity among informal workers exposed to cement dust: A comparative cross-sectional study.**

**Background:** Cement dust is a significant source of occupational exposure affecting lung function and respiratory health. A higher burden of respiratory morbidity is known among factory workers involved in cement production. Globally or from India, there are no estimates of this burden from informal workers exposed to cement dust. **Objective:** To assess difference in lung function and respiratory symptoms among informal workers exposed to cement and those unexposed, using a comparative community based cross-sectional study from purposively selected areas in Delhi, India. **Methods:** Using a portable spirometer we measured lung function and collected respiratory symptoms from conveniently sampled informal workers (n = 100) exposed to cement dust, 50 indoor informal workers (tailors), and 50 outdoor (vegetable) vendors. Regression analyses were performed to compare respiratory symptom score and lung function parameters, adjusted for age, body mass index, smoking, socioeconomic status, and years of occupational exposure. **Findings:** Exposed workers had significantly lower lung function (PEF = -750 ml/s and -810 ml/s and FEV1/FVC (%) = -3.87 and -2.11) compared to indoor and outdoor groups, with three times higher chronic respiratory symptoms when compared to the unexposed groups. The cement dust exposure was observed to be associated with PEF (mean difference (MD) = -0.75L, 95%CI = -1.36 to -0.15, p = 0.01), %FEV1/FVC (MD = -3.87, 95%CI = -6.77 to -0.96, p = 0.03) and respiratory symptoms (p < 0.001). **Conclusion:** This study generates evidence regarding the respiratory burden of occupational exposure among vulnerable informal workers. There is an urgent need for policy reforms to safeguard health from occupational exposures, especially among informal workers.

**Dushyant et al. 2023.**

**Annals of Global Health, vol. 89, no. 1.**

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**Keywords:** India; occupational health; cement dust; informal workers; lung function.

**Evidence Level:** 4B

**Link:** <https://annalsofglobalhealth.org/articles/10.5334/aogh.4089>

### **Burden of lung cancer and predicted costs of occupational exposure to hexavalent chromium in the EU: The impact of different occupational exposure limits.**

**Background:** Exposure to hexavalent chromium [Cr(VI)] occurs widely in occupational settings across the EU and is associated with lung cancer. In 2025, the occupational exposure limit is set to change to 5 µg/m<sup>3</sup>. Current exposure limits are higher, with 10 µg/m<sup>3</sup> as a general limit and 25 µg/m<sup>3</sup> for the welding industry. We aimed to assess the current burden of lung cancer caused by occupational exposure to Cr(VI) and to evaluate the impact of the recently established EU regulation by analysing different occupational exposure limits. **Methods:** Data were extracted from the literature, the Global Burden of Disease 2019 study, and Eurostat. We estimated the cases of cancer attributable to workplace exposure to Cr(VI) by combining exposure-effect relationships with exposure data, and calculated related DALYs and health costs in scenarios with different occupational exposure limits. **Results:** With current EU regulations, 253 cases (95%UI 250.96-255.71) of lung cancer were estimated to be caused by Cr(VI) in 2019, resulting in 4684 DALYs (95%UI 4683.57-4704.08). In case the welding industry adopted 10 µg/m<sup>3</sup>, a decrease of 43 cases and 797 DALYs from current values is expected. The predicted application of a 5 µg/m<sup>3</sup> limit would cause a

decrease of 148 cases and 2746 DALYs. Current costs are estimated to amount to 12.47 million euros/year (95%UI 10.19-453.82), corresponding to 39.97 million euros (95%UI 22.75-70.10) when considering costs per DALY. The limits implemented in 2025 would lead to a decrease of 23.35 million euros when considering DALYs, with benefits of introducing a limit value occurring after many decades. Adopting a 1  $\mu\text{g}/\text{m}^3$  limit would lower costs to 1.04 million euros (95%UI 0.85-37.67) and to 3.33 million euros for DALYs (95%UI 1.89-5.84). **Discussion:** Assessing different scenarios with different Cr(VI) occupational exposure limits allowed to understand the impact of EU regulatory actions. These findings make a strong case for adapting even stricter exposure limits to protect workers' health and avoid associated costs.

**Chen-Xu et al. 2023.**

**Environmental Research, vol. 228.**

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**Keywords:** Burden of disease; health costs; hexavalent chromium; lung cancer; occupational exposure; public health.

**Evidence Level:** 4B

**Link:** [https://linkinghub.elsevier.com/retrieve/pii/S0013-9351\(23\)00589-3](https://linkinghub.elsevier.com/retrieve/pii/S0013-9351(23)00589-3)

### **Evaluation of workplace exposure to respirable crystalline silica in road construction industries in Alberta.**

**Background:** Occupational exposure to respirable crystalline silica (RCS) is common for several occupations in construction, not only because of its presence in many handling materials but also in processes such as grinding and sawing. **Methods:** This study investigated workplace exposure to RCS as quartz in industries and occupations within road construction in Alberta through the RCS monitoring database provided by the Alberta Roadbuilders and Heavy Construction Association (ARHCA) between 2007 and 2016. Descriptive statistics were calculated for exposure-related variables, and mixed model analysis was performed to determine factors affecting the exposure levels. **Results:** Results showed that the highest exposed workers were in the sand and gravel industry ( $\text{GM} = 45 \mu\text{g}/\text{m}^3$ ). For worker occupations, geometric means ranged from  $78 \mu\text{g}/\text{m}^3$  for crusher operators to  $10 \mu\text{g}/\text{m}^3$  for concrete truck operators. The maximum exposure severity was 33.3 times the occupational exposure limit (OEL) for the sand and gravel and 31 times the OEL for tower operators. The results also showed the effect of seasonal variability on RCS exposure levels.

**Conclusions:** The heterogeneous exposure results indicated significant room for improvement and that controls should focus more on the activity performed than the occupation to lower exposure to RCS levels in industries.

**Couture et al. 2023.**

**Toxicology and Industrial Health, vol. 39, no. 7.**

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**Keywords:** Acute toxicity; air quality; lungs; occupational health; respiratory.

**Evidence Level:** 4B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10320711/>

### **Leukemia mortality among Benzene-exposed workers in Brazil (2006-2011).**

**Background:** In this study, the annual leukemia mortality rate is estimated by occupational groups potentially exposed to benzene in Brazil and compared to non-exposed workers by sex. **Methods:** Data were extracted from the Mortality Information System and the National Institute of Geography and Statistics from 2006 to 2011. Occupational groups exposed to benzene were defined by using the Finnish Job-Exposure Matrix, FINJEM. **Results:** We found 21,049 leukemia deaths in 1917 in occupational groups potentially exposed to benzene, corresponding to an annual average mortality rate of 4.5/100,000, higher than the estimate for non-exposed workers: 2.6/100,000, corresponding to a Mortality rate ratio MRR = 1.7. Each benzene-exposed occupational group had increased leukemia mortality, and printers and occupations in graphics presented the highest MRR (2.7), followed by laboratory assistants (MRR = 2.6), laundry workers, chemists, and upholsterers, each of these occupational groups presenting MRR = 2.3.

**Conclusions:** Benzene shows the need for better enforcement of protective norms against this known



carcinogen. Our results support the need for better enforcement of protective norms to reduce benzene exposure.

**Moura-Corrêa 2023.**

**International Journal of Environmental Research and Public Health**, vol. 20, no. 13.

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**Keywords:** Benzene 2; cancer; leukemia 3; mortality 4; occupational exposure 1.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/20/13/6314>

### **The rate of occupational noise-induced hearing loss among male workers in Israel and implication on hearing surveillance frequency.**

**Background:** To investigate the annual rate of NIHL in Israel, a modern economy with relatively low industrial hazardous noise exposure. To review international protocols of hearing surveillance. To recommend an effective, efficient, hearing screening frequency protocol. **Methods:** A historical cohort study was conducted. Audiometric surveillance data from the Jerusalem occupational medicine registry of male employees in various industries from 2006 to 2017 were used. Mean individual annual threshold shifts simulating 1-8 checkup interval years were calculated. Joinpoint regression analysis was used to assess the interval in which the slope of the calculated ATS variability moderates significantly. **Results:** A total of 263 noise-exposed workers and 93 workers in the comparison group produced 1913 audiograms for analysis. Among the noise-exposed workers, using the 1-4 kHz average, threshold shifts stabilized from 3 years onwards at around 1 dB per year in all age groups and 0.83 dB in the stratum younger than 50 years. No enhanced decline was detected in the first years of exposure. **Conclusion:** Although most countries conduct annual hearing surveillance, hearing threshold shifts of noise-exposed workers become more accurate and show less variability when calculated at 3-year checkup intervals onwards than shorter intervals. Since margins of errors of the test method are much larger than the annual shift found, screening schedule that enables each subsequent test to identify a real deterioration in hearing is necessary. Triennial audiometric screening would be a better surveillance frequency for noise-exposed workers younger than 50 years of age in the category of 85-95 dBL<sub>Aeq,8 h</sub> without other known risk factors.

**Makaruse et al. 2023.**

**International Archives of Occupational and Environmental Health**, vol. 96, no. 5.

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**Keywords:** Annual audiometry; hearing conservation; occupational noise exposure; occupational noise-induced hearing loss; occupational surveillance frequency; threshold shift.

**Evidence Level:** 4B

**Link:** <https://link.springer.com/article/10.1007/s00420-023-01975-8>

### **Exposure to soluble platinum salts in precious metal refinery workers over a 17-year period.**

**Background:** Occupational exposure to soluble chlorinated platinum (Pt) salts, commonly called chloroplatinates, is a known cause of Pt salt sensitisation (PSS) and occupational asthma. We aimed to model inhalable soluble Pt salts exposure levels based on measurements in precious metal refineries for use in a retrospective cohort study on PSS. **Methods:** Five platinum refineries located in the United Kingdom (3 sites), United States, and South Africa provided time weighted average inhalable soluble Pt salts exposure data, measured in 2,982 personal air samples over a 17-year period (2000-2016). We used a Bayesian hierarchical model to estimate geometric mean (GM) exposure levels for each refinery and job title over time. **Results:** The GM of measured exposure levels over all facilities was 92 ng/m<sup>3</sup> with a geometric standard deviation (GSD) of 9.07. Facility-specific GMs ranged from 48 ng/m<sup>3</sup> (GSD 15.3) to 242 ng/m<sup>3</sup> (GSD 5.99). Exposure modelling showed that soluble Pt salts exposure levels declined approximately 10% per year in two of the five facilities, but there were no clear time trends in the other facilities. A priori specified exposure groups captured most of the between-jobs differences, which helps to accurately predict exposures for jobs with no measurement data available. **Conclusions:** We applied exposure modelling to estimate time, refinery, and job-specific soluble Pt salts exposures. A significant annual decline

in exposure levels was observed in two of the five participating facilities. Modelled exposure levels can be linked to individual workers' job history for exposure-response analysis of PSS in an epidemiological study. **Smit et al. 2023.**

**Annals of Work Exposures and Health, vol. 67, no. 6.**

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**Keywords:** Chloroplatinate exposure; exposure modelling; job history; low molecular weight allergens; occupational allergy.

**Evidence Level:** 4B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10324643/>

### **The effects of tinnitus and tinnitus annoyance on need for recovery after work: Results of the Netherlands longitudinal study on hearing.**

**Background:** The first aim of this study was to examine the relationship between having tinnitus and the need for recovery after work (NFR). The second aim was to investigate whether the level of tinnitus annoyance is associated with NFR. **Design:** Data from the 5- and 10-year follow-up measurement rounds of the Netherlands Longitudinal Study on Hearing (NL-SH) were used in a cross-sectional analyses. The NL-SH is a web-based prospective cohort study and includes participants aged 18 to 70 years at baseline. For this study, we included only participants who worked at least 12 hours/week and were under the age of 65 years. Participants completed questionnaires on demographic, socioeconomic, psychosocial, hearing-related, and work-related characteristics. In addition, participants answered questions about hearing ability and tinnitus and performed an online digit-triplet speech recognition in noise test to measure the speech reception threshold (SRT) in noise. Participants were asked if (1) they suffer from tinnitus and (2) to rate tinnitus annoyance on a 0-100 numeric rating scale. A linear mixed model was used (1) to estimate the overall (i.e., cross-sectional) association between having tinnitus and NFR and (2) to estimate the overall association between the level of tinnitus annoyance and NFR. The models were checked for effect modification and confounding of factors known to be associated with either tinnitus or NFR and available in the NL-SH. **Results:** The study sample comprised 770 unique participants in total; 686 and 335 participants at 5- and 10-year follow-up, respectively. Distress, somatization, and self-reported hearing disability appeared to be confounding factors in the analysis of having tinnitus and NFR. After adjusting for these factors, participants with tinnitus had a 2.5% higher NFR (95% confidence interval: -0.9 to 5.9;  $p = 0.15$ ). In the analysis of tinnitus annoyance and NFR, SRT was an effect modifier. Distress, somatization, depression, and self-reported hearing disability were confounders. After adjustment for effect modification and confounding, tinnitus annoyance was not significantly associated with NFR ( $p = 0.79$  for tinnitus annoyance). **Conclusions:** This study showed that having tinnitus was not associated with a higher NFR. Also, higher levels of tinnitus annoyance were not associated with a higher NFR. NFR was associated with the psychological factors distress, somatization, and depression, which are known to be intricately related to tinnitus. A longitudinal study design is recommended as it can assess the sequence of events, which might help disentangle the association between tinnitus, NFR, and psychological factors.

**Simons et al. 2023.**

**Ear and Hearing, vol. 44, no. 4.**

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**Keywords:** Tinnitus; tinnitus annoyance; recovery; work; hearing.

**Evidence Level:** 4B

**Link:** [https://journals.lww.com/ear-hearing/Fulltext/2023/07000/The\\_Effects\\_of\\_Tinnitus\\_and\\_Tinnitus\\_Annoyance\\_on.10.aspx](https://journals.lww.com/ear-hearing/Fulltext/2023/07000/The_Effects_of_Tinnitus_and_Tinnitus_Annoyance_on.10.aspx)

### **Effectiveness of kurtosis-adjusted cumulative noise exposure in assessing occupational hearing loss associated with complex noise.**

**Background:** Occupational noise-induced hearing loss (NIHL) is one of the most prevalent occupational diseases worldwide. Few studies have been reported on applying kurtosis-adjusted noise energy (e.g., kurtosis-adjusted cumulative noise exposure, CNE-K) as a joint indicator for assessing NIHL. This study

aimed to analyze the effectiveness of CNE-K in assessing occupational hearing loss associated with complex noise in typical manufacturing industries. **Design:** A cross-sectional survey of 1404 Chinese manufacturing workers from typical manufacturing industries was conducted. General demographic characteristics, noise exposure data, and noise-induced permanent threshold shifts (NIPTS) at 3, 4, and 6 kHz (NIPTS 346 ) were collected and analyzed. The role of kurtosis in high-frequency noise-induced hearing loss (HFNIHL) was also analyzed. The degree of overlap of the two logistic curves (i.e., between complex noise CNE-K and HFNIHL%, and between Gaussian noise CNE and HFNIHL%) was used to evaluate the effectiveness of CNE-K, using a stratified analysis based on age, sex, industry, or job type. **Results:** The binary logistic regression analysis showed that in addition to age, sex, exposure duration, and Eight-hour Continuous Equivalent A-weighted Sound Pressure Level (L Aeq,8h ), kurtosis was a key factor influencing HFNIHL% in workers (odds ratio = 1.18,  $p < 0.05$ ), and its odds ratio increased with an increase in kurtosis value. Multiple linear regression analysis demonstrated that the contribution of kurtosis to NIPTS 346 was second to L Aeq,8h . Complex noise led to a higher risk of NIHL than Gaussian noise at frequencies of 3, 4, 6, and 8 kHz after adjusting for age, sex, and CNE (  $p < 0.05$ ). As kurtosis increased, the notch in the audiogram became deeper, and the frequency at which the notch began to deepen shifted from 3 to 1 kHz. The logistic curve between complex noise CNE-K and HFNIHL% nearly overlapped with that between Gaussian noise CNE and HFNIHL%, and the average difference in HFNIHL% between the two curves decreased from 8.1 to 0.4%. Moreover, the decrease of average difference in HFNIHL% between the two logistic curves was evident in several subgroups, such as male workers, aged <30 and 30 to 50 years, furniture and woodworking industries and gunning and nailing job types with relatively high kurtosis values. **Conclusions:** Kurtosis, as an indirect metric of noise temporal structure, was an important risk factor for occupational NIHL. Kurtosis-adjusted CNE metric could be more effective than CNE alone in assessing occupational hearing loss risk associated with complex noise.

**Xin et al. 2023.**

**Ear and Hearing, vol. 44, no. 4.**

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**Keywords:** Occupational noise-induced hearing loss; occupational disease; kurtosis-adjusted noise energy; noise exposure.

**Evidence Level:** 4B

**Link:** [https://journals.lww.com/ear-hearing/Fulltext/2023/07000/Effectiveness\\_of\\_Kurtosis\\_Adjusted\\_Cumulative.18.aspx](https://journals.lww.com/ear-hearing/Fulltext/2023/07000/Effectiveness_of_Kurtosis_Adjusted_Cumulative.18.aspx)

### **Nonlinear low dose hematotoxicity of benzene: A pooled analyses of two studies among Chinese exposed workers.**

**Background:** Impairment of the hematopoietic system is one of the primary adverse health effects from exposure to benzene. We previously have shown that exposure to benzene at low levels (<1 ppm) affects the blood forming system and that these effects were proportionally stronger at lower versus higher levels of benzene exposure. This observation is potentially explained by saturation of enzymatic systems.

**Methods:** Here we extend these analyses by detailed modeling of the exposure response association of benzene and its major metabolites (i.e. catechol, muconic acid, phenol, and hydroquinone) on peripheral white blood cell (WBC) counts and its major cell-subtypes (i.e. granulocytes, lymphocytes, and monocytes) using two previously published cross-sectional studies among occupationally exposed Chinese workers.

**Results:** Supra-linear exposure response associations were observed between air benzene concentrations (range ~ 0.1 - 100 ppm) and WBC counts and its cell-subtypes, with a larger than proportional decrease in cell counts at lower than at higher levels of benzene exposure. The hematotoxicity associations were largely similar in shape when the analyses were repeated with benzene urinary metabolites suggesting that enzymatic saturation is not a full explanation of the observed non-linearity with WBC endpoints.

**Discussion:** We hypothesize that the flattening of the exposure response curve especially at higher benzene exposure levels may reflect a response by the bone marrow to maintain hematopoietic homeostasis. Toxicity to the bone marrow and an induced hyper-proliferative response could both contribute to risk of

subsequently developing a hematopoietic malignancy. Additional work is needed to explore this hypothesis.

**Vermeulen et al. 2023.**

**Environment International, vol. 177.**

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**Keywords:** Benzene; complete blood cell count; exposure–response; hematotoxicity; quantile-regression.

**Evidence Level:** 5B

**Link:** <https://www.sciencedirect.com/science/article/pii/S0160412023002805?via%3Dihub>

### **Health symptoms, inflammation, and bioaerosol exposure in workers at biowaste pretreatment plants.**

**Background:** Biowaste pretreatment plants have been built within the last years in Denmark in order to recycle pre-sorted biowaste from houses, restaurants, and industry. **Methods:** We investigated the association between exposure and health at six biowaste pretreatment plants (visited twice) across Denmark. We measured the personal bioaerosol exposure, took blood samples, and administered a questionnaire. Thirty-one persons participated, 17 of them twice, resulting in 45 bioaerosol samples, 40 blood samples, and questionnaire answers from 21 persons. We measured exposure to bacteria, fungi, dust, and endotoxin, the total inflammatory potential of the exposures, and serum levels of the inflammatory markers serum amyloid A (SAA), high sensitivity C-reactive protein (hsCRP), and human club cell protein (CC16). **Results:** Higher exposures to fungi and endotoxin were found for workers with tasks inside the production area compared to workers with main tasks in the office area. A positive association was found between the concentration of anaerobic bacteria and hsCRP and SAA, whereas bacteria and endotoxin were inversely associated with hsCRP and SAA. A positive association between hsCRP and the fungal species *Penicillium digitatum* and *P. camemberti* were found, whereas an inverse association between hsCRP and *Aspergillus niger* and *P. italicum* were found. Staff with tasks inside the production area reported more symptoms of the nose than those working in the office area. **Conclusions:** To conclude, our results indicate that workers with tasks inside the production area are exposed to elevated levels of bioaerosols, and that this may affect workers' health negatively.

**Rasmussen et al. 2023.**

**Waste Management, vol. 167.**

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**Keywords:** CRP; clara cell protein; green jobs; occupational exposure; organic waste; waste recycling.

**Evidence Level:** 5B

**Link:** <https://www.sciencedirect.com/science/article/pii/S0956053X23003884?via%3Dihub>

## **Sedentary Practices**

*This month explore the effect of active workstations, and multicomponent interventions on occupational sedentary behaviour.*

### **The effects of active workstations on reducing work-specific sedentary time in office workers: A network meta-analysis of 23 randomized controlled trials.**

**Background:** Active workstations have been proposed as a feasible approach for reducing occupational sedentary time. This study used a network meta-analysis (NMA) to assess and compare the overall efficacy of active workstation interventions according to type and concomitant strategy for reducing work-specific sitting time in office workers. **Methods:** PubMed, Web of Science, EMBASE, and Cochrane Central Register of Controlled Trials (CENTRAL) databases were searched from database inception until May 2022 to obtain randomized controlled trials (RCTs) assessing the efficacy of active workstations with or without concomitant strategies for reducing occupational sedentary time in office workers. The risk of bias of the RCTs included in this study was assessed according to the Cochrane Handbook. An NMA with STATA 15.1 was used to construct a network diagram, league figures, and the final surface under the cumulative ranking curve (SUCRA) values. The certainty of evidence was assessed using the grading of

recommendations, assessment, development, and evaluation (GRADE) approach. **Results:** A total of 23 eligible studies including eight different types of interventions with 1428 office workers were included. NMA results showed that compared to a typical desk, multicomponent intervention (standardized mean difference (SMD) = - 1.50; 95% confidence interval (CI) - 2.17, - 0.82; SUCRA = 72.4%), sit-stand workstation + promotion (Reminders of rest breaks, posture variation, or incidental office activity) (SMD = - 1.49; 95%CI - 2.42, - 0.55; SUCRA = 71.0%), treadmill workstation + promotion (SMD = - 1.29; 95%CI - 2.51, - 0.07; SUCRA = 61.6%), and sit-stand workstation (SMD = - 1.10, 95%CI - 1.64, - 0.56; SUCRA = 50.2%) were effective in reducing occupational sedentary time for office workers. **Conclusions:** Multicomponent intervention, sit-stand workstation + promotion, treadmill workstation + promotion, and sit-stand workstation appear to be effective in reducing work-specific sedentary time for office workers. Furthermore, multicomponent interventions and active workstations + promotion better reduced work-specific sedentary time than active workstation alone. However, the overall certainty of the evidence was low. **Trial registration:** Our study protocol was registered with the International Prospective Register of Systematic Reviews (PROSPERO); registration number: CRD42022344432.

**Zhou et al. 2023.**

**International Journal of Behavioral Nutrition and Physical Activity, vol. 20, no. 1.**

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**Keywords:** Active workstation; network meta-analysis; sedentary behavior; workplace.

**Evidence Level:** 1A

**Link:** <https://ijbnpa.biomedcentral.com/articles/10.1186/s12966-023-01467-5>

### **Effectiveness of multicomponent interventions in office-based workers to mitigate occupational sedentary behavior: Systematic review and meta-analysis.**

**Background:** Sedentary time in workplaces has been linked to increased risks of chronic occupational diseases, obesity, and overall mortality. Currently, there is a burgeoning research interest in the implementation of multicomponent interventions aimed at decreasing sedentary time among office workers, which encompass a comprehensive amalgamation of individual, organizational, and environmental strategies. **Objective:** This meta-analysis aims at evaluating the effectiveness of multicomponent interventions to mitigate occupational sedentary behavior at work compared with no intervention. **Methods:** PubMed, Web of Science, EMBASE, and Cochrane Central Register of Controlled Trials (CENTRAL) databases were searched from database inception until March 2023 to obtain randomized controlled trials (RCTs) assessing the efficacy of multicomponent interventions on occupational sedentary behavior among office-based workers. Two reviewers independently extracted the data and assessed the risk of bias by using the Cochrane Collaboration's risk of bias tool. The average intervention effect on sedentary time was calculated using Stata 15.1. Mean differences (MDs) with 95% CIs were used to calculate the continuous variables. Subgroup analyses were performed to determine whether sit-stand workstation, feedback, and prompt elements played an important role in multicomponent interventions. Further, the GRADE (Grading of Recommendations, Assessment, Development, and Evaluation) system was used to evaluate the certainty of evidence. **Results:** A total of 11 RCTs involving 1894 patients were included in the analysis. Five studies were rated as low risk of bias, 2 as unclear risk of bias, and 4 as high risk. The meta-analysis results showed that compared with no intervention, multicomponent interventions significantly reduced occupational sitting time (MD=-52.25 min/8-h workday, 95% CI -73.06 to -31.44;  $P<.001$ ) and occupational prolonged sitting time (MD=-32.63 min/8-h workday, 95% CI -51.93 to -13.33;  $P=.001$ ) and increased occupational standing time (MD=44.30 min/8-h workday, 95% CI 23.11-65.48;  $P<.001$ ), whereas no significant differences were found in occupational stepping time ( $P=.06$ ). The results of subgroup analysis showed that compared with multicomponent interventions without installment of sit-stand workstations, multicomponent interventions with sit-stand workstation installment showed better effects for reducing occupational sitting time (MD=-71.95 min/8-h workday, 95% CI -92.94 to -51.15), increasing occupational standing time (MD=66.56 min/8-h workday, 95% CI 43.45-89.67), and reducing occupational prolonged sitting time (MD=-47.05 min/8-h workday, 95% CI -73.66 to -20.43). The GRADE evidence summary showed that all 4 outcomes were rated as moderate certainty.

**Conclusions:** Multicomponent interventions, particularly those incorporating sit-stand workstations for all

participants, are effective at reducing workplace sedentary time. However, given their cost, further research is needed to understand the effectiveness of low-cost/no-cost multicomponent interventions.

**Zhou et al. 2023.**

**JMIR Public Health, vol. 9.**

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**Keywords:** Multicomponent; sedentary behavior; systematic review; workplace.

**Evidence Level:** 1A

**Link:** <https://publichealth.jmir.org/2023/1/e44745>

## Physical Activity

*This month we explore the rate of sports-related injuries sustained by fire service officers, and the effect of an electronic passive prompt intervention on physical activity in desk-based adults working from home.*

### **Sports-related injuries sustained by officers of the State Fire Service on duty: Nationwide 7-year follow-up.**

**Background:** The accident rate in the State Fire Service from 2015 to 2021 related to sports activities was analyzed in relation to the regions of the country per year. **Materials and methods:** The study included analysis of data from the SFS Headquarters - Department for Occupational Health and Safety and Preventive Health. Data collected from across the country in the form of an annual analysis of the accident. The reports included such information as: the number of accidents, the cause and circumstances of accident (injury), with a breakdown listing individual and group accidents. **Results:** During the observation period, about 30,000 officers were on duty in the SFS, of which about 20% were on daily (8-h) duty, and 80% were on shift (24-h) duty. Between 2015 and 2021, there were  $N = 11,332$  (Mean: 1617.4; SD: 284.1) accidents in SFS. Total accident covers individual and mass accidents. The number of sports injuries was  $N = 4,254$  (Mean: 532.2; SD: 137.9). **Conclusion:** There is a need for comprehensive approach to physical training in the firefighter population. Physical activity should be continuous and systematic strengthening of the whole body. Sports activities should begin with performing thorough warm-ups. It is necessary to maintain facilities, premises, equipment and technical devices in a condition that sets the ground for doing sports safely and in a hygienic manner. Most of the sports injuries sustained by firefighters are related to team sports.

**Dudziński et al. 2023.**

**Frontiers in Public Health, vol. 11.**

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**Keywords:** State Fire Service; contusions to injuries; injuries; physical activity; sports activities.

**Evidence Level:** 4B

**Link:** <https://www.frontiersin.org/articles/10.3389/fpubh.2023.1204841/full>

### **The effect of an electronic passive prompt intervention on prolonged occupational sitting and light-intensity physical activity in desk-based adults working from home during COVID-19 in Ireland.**

**Background:** This study aimed to assess the effect of passive prompts on occupational physical behaviours (PBs) and bouts of prolonged sitting among desk-based workers in Ireland who were working from home during the COVID-19 pandemic. Electronic passive prompts were delivered every 45 min, asking participants to walk for five minutes, during working hours. **Methods:** Twenty-eight participants (aged 30-67 years) completed the six-week intervention between October 2020 and April 2021. PBs were measured using an activPAL3™ accelerometer, following a 24 h wear protocol, worn for the duration of the study. **Results:** Participants were highly sedentary at both baseline (77.71% of work hours) and during the intervention (75.81% of work hours). However, the number of prolonged occupational sedentary bouts > 90 min was reduced compared to baseline ( $0.56 \pm 0.08$  vs.  $0.77 \pm 0.11$ ,  $p = 0.009$ ). Similar reductions were observed in the time spent in sustained sitting > 60 and >90 min when compared to baseline sedentary

patterns (60 min:  $-31.27 \pm 11.91$  min,  $p = 0.014$ ; 90 min:  $-27.97 \pm 9.39$  min,  $p = 0.006$ ). Light-intensity physical activity (LIPA) significantly increased during the intervention ( $+14.29\%$ ,  $p = 0.001$ ). **Conclusions:** This study demonstrates that passive prompts, delivered remotely, can both reduce the number and overall time spent in prolonged bouts of occupational sedentary behaviour and increase occupational LIPA. **Buffey et al. 2023.**

**International Journal of Environmental Research and Public Health, vol. 20, no. 13.**

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**Keywords:** Accelerometry; light-intensity physical activity; occupational physical behaviours; prolonged sitting; sedentary behaviour; sedentary breaks; workplace.

**Evidence Level:** 3B

**Link:** <https://www.mdpi.com/1660-4601/20/13/6294>

## Musculoskeletal Health

*This month we explore the risk factors for work-related low back pain, and musculoskeletal disorders in construction and telework, and the effect of a passive back exoskeleton on work efficiency.*

### **Magnitude and influencing factors of work-related low back pain among high school teachers in West Arsi zone, Southwest Ethiopia: Evidenced from multicentred cross-sectional study.**

**Background:** This study aimed to investigate the prevalence of low back pain and its associated factors among high school teachers in the West Arsi zone, Southwest Ethiopia. **Design:** A school-based cross-sectional study was conducted from February to March 2020. A self-administered structured Nordic Musculoskeletal questionnaire was used to assess low back pain during the past 12 months. Bivariate and multivariable binary logistic regression analysis was carried out using Stata V.14. The degree of significance was obtained at a 95% CI and  $p < 0.05$ . **Setting:** The study was conducted in the West Arsi zone, Ethiopia. **Participants:** A total of 602 teachers participated in this study. **Outcome measures:** The primary outcome is the prevalence of low back pain. **Results:** The prevalence of low back pain during the last 12 months was found to be 63.73% (95% CI 59.77% to 67.70%). About 225 (39.61%) teachers experienced moderate pain, and (89.79%) of them had a minimal disability. Being unmarried (adjusted OR (AOR) 0.47, 95% CI 0.28 to 0.79), prolonged standing (AOR 2.31, 95% CI 1.16 to 4.60), sleeping disturbance (AOR 3.22, 95% CI 1.41 to 7.36), regular physical activity (AOR 0.52, 95% CI 0.33 to 0.84), current smoker (AOR 2.83, 95% CI 1.04 to 7.67), lifting heavy load (AOR 1.96, 95% CI 1.17 to 3.28), psychological job demand (AOR 2.86, 95% CI 1.69 to 4.84) and job satisfaction (AOR 0.46, 95% CI 0.27 to 0.79) were associated with low back pain.

**Conclusion:** The prevalence of low back pain was high in this study. Prolonged standing, sleep disruption, heavy load lifting, cigarette smoking and psychological job demand were risk factors for low back pain. Physical exercise and workplace satisfaction were effective interventions. Emphasis should now be put on ergonomics, regular physical activity and psychosocial factors to lessen the problem.

**Gemedo et al. 2023.**

**BMJ Open, vol. 13, no. 7.**

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**Keywords:** Back pain; risk factors; schools.

**Evidence Level:** 4B

**Link:** <https://bmjopen.bmj.com/content/13/7/e074014.long>

### **Work performance in industry: The impact of mental fatigue and a passive back exoskeleton on work efficiency.**

**Background:** Mental fatigue (MF) is likely to occur in the industrial working population. However, the link between MF and industrial work performance has not been investigated, nor how this interacts with a passive lower back exoskeleton used during industrial work. **Methods:** Therefore, to elucidate its potential effect(s), this study investigated the accuracy of work performance and movement duration through a dual task paradigm and compared results between mentally fatigued volunteers and controls, with and without the exoskeleton. **Results:** No main effects of MF and the exoskeleton were found. However, when mentally

fatigued and wearing the exoskeleton, movement duration significantly increased compared to the baseline condition ( $\beta_{MF:Exo} = 0.17$ ,  $p = .02$ ,  $\omega^2 = .03$ ), suggesting an important interaction between the exoskeleton and one's psychobiological state. Importantly, presented data indicate a negative effect on production efficiency through increased performance time. **Conclusions:** Further research into the cognitive aspects of industrial work performance and human-exoskeleton interaction is therefore warranted.

**Govaerts et al. 2023.**

**Applied Ergonomics, vol. 110.**

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**Keywords:** Manufacturing; mental fatigue; robotics.

**Evidence Level:** 5B

**Link:** <https://www.sciencedirect.com/science/article/pii/S0003687023000649?via%3Dihub>

### **Construction and validation of a musculoskeletal disease risk prediction model for underground coal miners.**

**Background:** To understand the prevalence among underground coal miners of musculoskeletal disorders (MSDs), analyze the risk factors affecting MSDs, and develop and validate a risk prediction model for the development of MSDs. **Materials and methods:** MSD questionnaires were used to investigate the prevalence of work-related musculoskeletal disorders among 860 underground coal miners in Xinjiang. The Chinese versions of the Effort-Reward Imbalance Questionnaire (ERI), the Burnout Scale (MBI), and the Self-Rating Depression Inventory (SDS) were used to investigate the occupational mental health status of underground coal miners. The R4.1.3 software cart installation package was applied to randomly divide the study subjects into a 1:1 training set and validation set, screen independent predictors using single- and multi-factor regression analysis, and draw personalized nomogram graph prediction models based on regression coefficients. Subject work characteristic (ROC) curves, calibration (Calibrate) curves, and decision curves (DCA) were used to analyze the predictive value of each variable on MSDs and the net benefit.

**Results:** (1) The prevalence of MSDs was 55.3%, 51.2%, and 41.9% since joining the workforce, in the past year, and in the past week, respectively; the highest prevalence was in the lower back (45.8% vs. 38.8% vs. 33.7%) and the lowest prevalence was in the hips and buttocks (13.3% vs. 11.4% vs. 9.1%) under different periods. (2) Underground coal miners: the mean total scores of occupational stress, burnout, and depression were  $1.55 \pm 0.64$ ,  $51.52 \pm 11.53$ , and  $13.83 \pm 14.27$ , respectively. (3) Univariate regression revealed a higher prevalence of MSDs in those older than 45 years (49.5%), length of service > 15 years (56.4%), annual income <\$60,000 (79.1%), and moderate burnout (43.2%). (4) Binary logistic regression showed that the prevalence of MSDs was higher for those with 5-20 years of service (OR = 0.295, 95% CI: 0.169-0.513), >20 years of service (OR = 0.845, 95% CI: 0.529-1.350), annual income  $\geq$ \$60,000 (OR = 1.742, 95% CI: 1.100-2.759), and severe burnout (OR = 0.284, 95% CI: 0.109-0.739), and that these were independent predictors of the occurrence of MSDs among workers in underground coal mine operations ( $p < 0.05$ ). (5) The areas under the ROC curve for the training and validation sets were 0.665 (95% CI: 0.615-0.716) and 0.630 (95% CI: 0.578-0.682), respectively, indicating that the model has good predictive ability; the calibration plots showed good agreement between the predicted and actual prevalence of the model; and the DCA curves suggested that the predictive value of this nomogram model for MSDs was good.

**Conclusion:** The prevalence of MSDs among workers working underground in coal mines was high, and the constructed nomogram showed good discriminatory ability and optimal accuracy.

**Zhao et al. 2023.**

**Frontiers in Public Health, vol. 11.**

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**Keywords:** Depression; musculoskeletal disorders; nomogram; occupational job burnout; occupational stress; underground coal miners.

**Evidence Level:** 4B

**Link:** <https://www.frontiersin.org/articles/10.3389/fpubh.2023.1099175/full>



### **Telework-related risk factors for musculoskeletal disorders.**

**Background:** Telework has become considerably more common during the ongoing pandemic. Although working remotely may have numerous advantages, negative impacts on workers' health and safety should also be considered. Telework is a major contributor to the development or aggravation of work-related musculoskeletal disorders where unsuited workstation ergonomics, sedentary behavior, as well as psychosocial and organizational factors play a role. This paper aims to identify telework-related risks and their impact on musculoskeletal health as well as provide recommendations that may be useful in constructing future preventive measures. **Methods:** A comprehensive literature search regarding the topic has been performed. **Results:** Teleworkers experience musculoskeletal pain and discomfort mostly in low back area, neck, shoulders, arms, and hands. Poor ergonomic solutions when it comes to workstation design resulting in prolonged sitting in non-neutral positions contribute to the development and aggravation of musculoskeletal disorders in teleworkers. Working with inadequately placed screens and laptops and sitting in maladjusted seats without usual functionalities and ergonomic support is associated with musculoskeletal pain and discomfort. Extended working hours with fewer rest periods to meet increased work demands, social isolation, and lack of support from work colleagues and superiors as well as blurred work-home boundaries and omnipresence of work are commonly stated psychosocial and organizational factors associated with musculoskeletal disorders. Environmental factors such as poor lighting and glare, inadequate room temperature, and ventilation or noise, are frequently overlooked remote workstation risk factors. For a certain part of workers, telework will remain a common way of work in the post-pandemic period. **Conclusions:** Therefore, it is essential to identify telework-related risk factors for musculoskeletal disorders and address them with timely preventive measures tailored to each remote workstation's risks and individual workers' needs.

**Milaković et al. 2023.**

**Frontiers of Public Health, vol. 11.**

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**Keywords:** COVID-19; ergonomic risks; musculoskeletal disorders; pandemic; psychosocial risks; telework.

**Evidence Level:** 6A

**Link:** <https://www.frontiersin.org/articles/10.3389/fpubh.2023.1155745/full>

### **Risk factors analysis and risk prediction model construction of non-specific low back pain: An ambidirectional cohort study.**

**Background:** Non-specific low back pain (NLBP) is a common clinical condition that affects approximately 60-80% of adults worldwide. However, there is currently a lack of scientific prediction and evaluation systems in clinical practice. The purpose of this study was to analyze the risk factors of NLBP and construct a risk prediction model. **Methods:** We collected baseline data from 707 patients who met the inclusion criteria and were treated at the Sixth Hospital of Ningbo from December 2020 to December 2022. Logistic regression and LASSO regression were used to screen independent risk factors that influence the onset of NLBP and to construct a risk prediction model. The sensitivity and specificity of the model were evaluated by tenfold cross-validation, and internal validation was performed in the validation set. **Results:** Age, gender, BMI, education level, marital status, exercise frequency, history of low back pain, labor intensity, working posture, exposure to vibration sources, and psychological status were found to be significantly associated with the onset of NLBP. Using these 11 predictive factors, a nomogram was constructed, and the area under the ROC curve of the training set was 0.835 (95% CI 0.756-0.914), with a sensitivity of 0.771 and a specificity of 0.800. The area under the ROC curve of the validation set was 0.762 (95% CI 0.665-0.858), with a sensitivity of 0.800 and a specificity of 0.600, indicating that the predictive value of the model for the diagnosis of NLBP was high. In addition, the calibration curve showed a high degree of consistency between the predicted and actual survival probabilities. **Conclusion:** We have developed a preliminary predictive model for NLBP and constructed a nomogram to predict the onset of NLBP. The model demonstrated good performance and may be useful for the prevention and treatment of NLBP in clinical practice.

**Lu et al. 2023.**

**Journal of Orthopaedic Surgery and Research, vol. 18, no. 1.**

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**Keywords:** Nomogram; non-specific low back pain; prediction model; risk factors.

**Evidence Level:** 4B

**Link:** <https://josr-online.biomedcentral.com/articles/10.1186/s13018-023-03945-9>

## Guiding and Supporting Mental Health and Wellbeing

### Mental Health

*This month we explore the relationship between worker mental health and sleep quality, sickness absence, social stressors, work stress and interpersonal needs, work breaks, and affirming educational and workplace settings for LGBTQA + workers. In Covid related research we explore associations between Covid related changes in the psychosocial work environment and mental health.*

#### **The impact of sleep quality on mental health in working Australians: A quasi-experimental approach.**

**Background:** Work conditions such as job demand can impact individual sleep quality, and subsequently impact mental health. This study aims to investigate pathway effects of exogenous factors on mental health via sleep, and the direct effect of sleep quality on mental health in working Australians. **Methods:** We employ a novel method in public health studies, a quasi-experimental (instrumental variable) approach, which can address reciprocal relationships between sleep and mental health in order to estimate causal effect of sleep quality on mental health in a sample of 19,789 working Australians aged 25-64 from waves 2013, 2017, and 2021 of the Household, Income and Labour Dynamics in Australia (HILDA) survey data. **Results:** We find that high job demand, as a valid instrument, adversely affects sleep quality, and the changes in sleep quality ultimately affect mental health of working Australians. **Conclusions:** These findings highlight the need for policies that address employment conditions by reducing high work demand or work pressure to mitigate poor sleep quality in the Australian workforce, ultimately improving workers' sleep quality and promoting better mental health, overall health outcomes and productivity.

**Foo et al. 2023.**

**Social Science and Medicine, vol. 329.**

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**Keywords:** Australia; job demand; mental health; quasi-experimental approach; sleep quality.

**Evidence Level:** 4A

**Link:** <https://www.sciencedirect.com/science/article/pii/S0277953623003969?via%3Dihub>

#### **Reducing sickness absence and stigma due to mental health difficulties: A randomised control treatment trial (RCT) of a low intensity psychological intervention and stigma reduction programme for common mental disorder (Prevail).**

**Background:** Common mental disorders are the leading cause of workplace absences. The Prevail intervention programme aims to reduce stigma and to educate staff and managers about evidence-based low intensity psychological interventions for common mental disorders (depression, anxiety, stress, and distress). Prevail is innovative in taking a public health approach. It is designed to be given to all employees irrespective of their past or current mental health. Prevail was evaluated in three studies examining: (1) the acceptability of the intervention and perceived usefulness; (2) whether the intervention altered stigmatic attitudes and motivation to seek help; and (3) whether the intervention reduced sickness absence, both overall and due to mental health problems. **Methods:** A two-armed cluster randomised control trial (RCT) evaluated the effectiveness of Prevail. Employees (N = 1051) at a large UK government institution were randomised to an active intervention or control arm in teams identified by their managers (n = 67). Employees in the active arm received the Prevail Staff Intervention. The managers in the active arm also received the Prevail Managers Intervention. Participants' satisfaction and analysis of the Prevail Intervention were gathered by a bespoke questionnaire. Questionnaire measures of attitudes to mental

health and mental health stigma were taken 1-2 weeks prior to the intervention and approximately 4 weeks post-intervention. Data relating to sickness absence were gathered via the official records in the time period 3-month post-intervention and for the same period 12 months earlier. **Results:** Prevail was evaluated highly favourably by both the staff and their managers. Prevail produced significant reductions in self-stigma and anticipated stigma due to mental health difficulties. Crucially, sickness absence was significantly reduced by the Prevail Intervention. **Discussion:** Prevail achieved its goals of producing a palatable and engaging intervention that altered staff's attitudes and stigmatic beliefs related to mental health and, crucially, produced a strong reduction in work-pace absenteeism. As the Prevail programme is aimed at common mental health problems and was not specialised to this particular workforce, the study provides the evidence-base for a mental health intervention programme that could be used by many organisations across the world. **Trial registration:** ISRCTN12040087. Registered 04/05/2020. <https://doi.org/10.1186/ISRCTN12040087>. A full protocol for the randomised control trial was published: Gray NS, Davies H, Snowden RJ: Reducing stigma and increasing workplace productivity due to mental health difficulties in a large government organization in the UK: a protocol for a randomised control treatment trial (RCT) of a low intensity psychological intervention and stigma reduction programme for common mental disorder (Prevail). BMC Public Health 2020, 20(1):1-9.

**Gray et al. 2023.**

**BMC Public Health, vol. 23, no. 1.**

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**Keywords:** Absenteeism; co-production; low-intensity psychological interventions; prevail; randomised control trial; self-stigma; stigma; work-based intervention.

**Evidence Level:** 2B

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-16200-x>

**"My young life, finished already?": A qualitative study of embedded social stressors and their effects on mental health of low-wage male migrant workers in Singapore.**

**Background:** Increasing evidence shows low-wage migrant workers experience a high prevalence of mental health disorders and adverse health outcomes. Significant disparities in health services usage among migrant workers create added vulnerability to health complications. However, much remains unclear about how vulnerabilities are constructed in migrant worker populations. Additionally, no studies in Singapore have attempted to critically examine the degree to which social environment and structures affect the health and wellbeing of migrant workers. Therefore, this study aimed to critically situate the socio-structural factors creating conditions of vulnerability among migrant workers using a social stress perspective. **Methods:** We conducted semi-structured individual and group interviews with migrant workers focused on individual life experiences, community experiences (individual and collective social capital), health (mental and physical health concerns) and stress response behaviours. We used a grounded theory approach to identify sources of stress and stress responses and uncover pathways to social vulnerabilities. **Results:** Findings from 21 individual and 2 group interviews revealed that migrant workers were embedded in a cycle of chronic stress driven by structural factors that were mutually reinforced by stressors arising from their social environment. Socio-structural stressors enacted as poor living, working and social conditions resulted in their negative quality-of-life appraisal. Stressors arising from being "foreign" resulted in anticipated stigma, concealment, and healthcare avoidance. These factors synergistically created a persistent mental health burden for migrant workers. **Conclusions:** Findings highlight the need to address the mental health burden placed on migrant workers and create avenues for migrant workers to seek psychosocial support to manage their stressors.

**Farwin et al. 2023.**

**Global Health, vol. 19, no. 1.**

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**Keywords:** Health inequity; mental health; migrant workers; social stress; stress responses; vulnerability.

**Evidence Level:** 5B

**Link:** <https://globalizationandhealth.biomedcentral.com/articles/10.1186/s12992-023-00946-5>

### **Associations between COVID-19-related changes in the psychosocial work environment and mental health.**

**Background:** Individuals' lives have been substantially affected by the COVID-19 pandemic. We aimed to describe changes in psychosocial work environment and mental health and to investigate associations between job insecurity and mental ill-health in relation to changes in other psychosocial work factors, loneliness and financial worries. **Methods:** A sub-sample of individuals from the eighth Swedish Longitudinal Occupational Survey of Health answered a web-based survey in early 2021 about current and pandemic-related changes in health, health behaviours, work and private life. We investigated participants working before the pandemic ( $N=1231$ ) in relation to standardised measures on depression, anxiety and loneliness, together with psychosocial work factors, in descriptive and logistic regression analyses.

**Results:** While 9% reached the clinical threshold for depression and 6% for anxiety, more than a third felt more worried, lonelier or in a low mood since the start of the pandemic. Two per cent had been dismissed from their jobs, but 16% experienced workplace downsizings. Conditioning on socio-demographic factors and prior mental-health problems, the 8% experiencing reduced job security during the pandemic had a higher risk of anxiety, but not of depression, compared to employees with unaltered or increased job security. Loneliness and other psychosocial work factors explained more of the association than objective measures of job insecurity and financial worries. **Conclusions:** Reduced job security during the COVID-19 pandemic seems to have increased the risk of anxiety among individuals with a strong labour market attachment, primarily via loneliness and other psychosocial work factors. This illustrates the potentially far-reaching effects of the pandemic on mental health in the working population.

**Blomqvist et al. 2023.**

**Scandinavian Journal of Work, Environment and Health, vol. 51, no. 5.**

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**Keywords:** COVID-19; anxiety; depression; employment insecurity; loneliness; psychological distress; psychosocial work environment; work stress.

**Evidence Level:** 4B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10040465/>

### **Affirming educational and workplace settings are associated with positive mental health and happiness outcomes for LGBTQA + youth in Australia.**

**Background:** Affirming socio-cultural settings are essential for protecting the mental health and wellbeing of lesbian, bisexual or pansexual, trans and gender diverse, asexual and queer (LGBTQA +) youth. However, limited research has explored the role of affirming educational and workplace settings, as reported by LGBTQA + youth themselves, with respect to their mental health and wellbeing. Moreover, existing research maintains a focus on mitigating poor mental health outcomes, with little attention to positive wellbeing outcomes among LGBTQA + youth. **Methods:** Using data from the largest national survey of LGBTQA + youth aged 14-21 in Australia, multivariable regression analyses were conducted to explore associations between affirming educational and workplace settings and psychological distress and subjective wellbeing among 4,331 cisgender and 1,537 trans and gender diverse youth. Additionally, a series of multivariable regression analyses were conducted to explore individual sociodemographic traits that are associated with reporting affirming educational or workplace settings. **Results:** Both cisgender and trans or gender diverse participants who reported that their education institution or workplace were affirming of their LGBTQA + identity reported lower levels of psychological distress as well as higher levels of subjective happiness. Additionally, affirming environments were not experienced equally across all subsections of LGBTQA + youth, with reporting of an affirming educational or workplace setting differing most noticeably across gender, type of educational institution and residential location. **Conclusion:** The findings demonstrate that affirming educational and workplace settings can result not only in better mental health, but also greater levels of subjective happiness among LGBTQA + youth. The outcomes illustrate the importance of ensuring all LGBTQA + youth are afforded the opportunity to thrive in environments where they feel validated and confident to express their identities. The findings further highlight a need to target education institutions and workplaces to ensure the implementation of policies and practices that promote not just inclusion of LGBTQA + youth but affirmation of their identities.

**Amos et al. 2023.**

**BMC Public Health, vol. 23, no. 1.**

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**Keywords:** Affirmation; education; happiness; LGBTQA; mental health; wellbeing; work; youth.

**Evidence Level:** 4A

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-16034-7>

### **Relationships of work stress and interpersonal needs with industrial workers' mental health: A moderated mediation model.**

**Background:** This study explores whether feelings of defeat (i.e., a sense of failed struggle and losing rank; referred to as defeat for simplicity) mediated the effect of work stress on depression/anxiety, the effect of interpersonal needs on depression/anxiety for Chinese industrial workers, and the possible moderating role of social support. **Method:** A cross-sectional study was conducted in Shenzhen, China in 2019, in total, 2023 industrial workers (of 2700 invited; response rate = 75%) completed a self-administered survey consisted of Job Stress Scale, Interpersonal Needs Questionnaire, Defeat Scale, Centre for Epidemiological Studies Depression Scale, Generalized Anxiety Disorder Scale, two face-valid questions for social support, as well as sociodemographic information. Moderated mediation model was tested and loop plots were applied to probe into the conditional effects of work and interpersonal stress on depression and anxiety symptoms.

**Result:** Both the direct and indirect effect of work stress on depression and anxiety through defeat were significant (Work stress→ Depression:  $B = 0.035$ ,  $p < .001$ , Work stress→ Defeat→ Depression:  $B = 0.034$ ,  $p < .001$ ; Work stress→ Anxiety:  $B = 0.038$ ,  $p < .001$ , Work stress→ Defeat→ Anxiety:  $B = 0.045$ ,  $p < .001$ ).

Meanwhile, defeat mediated the relationship of interpersonal needs with depression partially and the relationship of interpersonal needs with anxiety totally (Interpersonal needs→ Anxiety:  $B = 0.133$ ,  $p < .001$ , Interpersonal needs→ Defeat→ Anxiety:  $B = 0.010$ ,  $p = .537$ ). Social support moderated the indirect path between interpersonal needs and depression/anxiety and buffered the effect. **Conclusion:** The mediating role of defeat and the moderator role of social support in the relationship between stress and depression/anxiety were confirmed in industrial workers. Workers who reported more work and interpersonal stress would report more defeat feelings, and then exhibited more depression and anxiety symptoms; this mediation effect was stronger for those who had lower social support, respectively.

**Wang et al. 2023.**

**BMC Public Health, vol. 23, no. 1.**

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**Keywords:** Anxiety; defeat; depression; industrial workers; interpersonal needs; work stress.

**Evidence Level:** 4B

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-16002-1>

### **Employees' work breaks and their physical and mental health: Results from a representative German survey.**

**Background:** This study aimed to investigate the prevalence of three characteristics of work break organization, namely skipping work breaks, interruptions of work breaks, and meal break duration, and their relationships with physical and mental health. **Methods:** We used data from the BAuA-Working Time Survey 2017, a representative workforce survey in Germany, and restricted the sample to 5979 full-time employees. Logistic regression analyses were conducted with in total five health complaints as dependent variables: back pain and low back pain, pain in the neck and shoulder region, general tiredness, faintness, or fatigue, physical exhaustion, and emotional exhaustion. **Results:** Many employees often skipped their work breaks (29%) and experienced break interruptions (16%). Frequent skipping of work breaks was significantly positively, that is detrimentally, related to all five health complaints and frequent interruptions of work breaks also, except for neck and shoulder pain. **Conclusions:** Meal break duration was significantly negatively, that is beneficially, related to physical exhaustion.

**Vieten et al. 2023.**

**Applied Ergonomics, vol. 110.**

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**Keywords:** Exhaustion; musculoskeletal pain; rest break.

**Evidence Level:** 4B

**Link:** <https://www.sciencedirect.com/science/article/pii/S0003687023000364?via%3Dihub>

### **Burnout syndrome and sleep quality in basic education teachers in Mexico.**

**Background:** Burnout syndrome (BS) is the result of chronic stress in the workplace. Moreover, chronic stress can affect sleep. A unidirectional relationship has been established between burnout and sleep, and it is known that white-collar workers with burnout syndrome have sleep fragmentation and marked daytime sleepiness. The aim of this study was to assess the relationships between burnout and sleep quality in elementary school teachers in Mexico. **Methods:** We collected data from more than 400 teachers who completed tests. Correlation analyses controlled for anxiety and depression, and Poisson logistic regression analyses were performed to examine the relationships of burnout with sleep quality, depression, and anxiety. **Results:** There was a significant correlation between burnout syndrome (mainly in the dimension of emotional exhaustion) and sleep disturbances; significant correlations were also observed with other burnout, depression, and anxiety dimensions. The strength of the correlations decreased after controlling for depression and anxiety. **Conclusions:** The symptoms of burnout syndrome in teachers can overlap with sleep disorders, so it is necessary to make a differential diagnosis to differentiate burnout syndrome from depression and anxiety, among others.

**Sánchez-Narváez et al. 2023.**

**International Journal of Environmental Research and Health, vol. 20, no. 13.**

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**Keywords:** Anxiety; burnout syndrome; depression; sleep quality.

**Evidence Level:** 5B

**Link:** <https://www.mdpi.com/1660-4601/20/13/6276>

### **Bullying, Harassment and Occupational Violence**

*This month we explore the relationship between workplace violence and bullying with later suicide risk, and workplace harassment and mental health and alcohol misuse.*

#### **Association of workplace violence and bullying with later suicide risk: A multicohort study and meta-analysis of published data.**

**Background:** Workplace offensive behaviours, such as violence and bullying, have been linked to psychological symptoms, but their potential impact on suicide risk remains unclear. We aimed to assess the association of workplace violence and bullying with the risk of death by suicide and suicide attempt in multiple cohort studies. **Methods:** In this multicohort study, we used individual-participant data from three prospective studies: the Finnish Public Sector study, the Swedish Work Environment Survey, and the Work Environment and Health in Denmark study. Workplace violence and bullying were self-reported at baseline. Participants were followed up for suicide attempt and death using linkage to national health records. We additionally searched the literature for published prospective studies and pooled our effect estimates with those from published studies. **Findings:** During 1 803 496 person-years at risk, we recorded 1103 suicide attempts or deaths in participants with data on workplace violence (n=205 048); the corresponding numbers for participants with data on workplace bullying (n=191 783) were 1144 suicide attempts or deaths in 1 960 796 person-years, which included data from one identified published study. Workplace violence was associated with an increased risk of suicide after basic adjustment for age, sex, educational level, and family situation (hazard ratio 1.34 [95% CI 1.15-1.56]) and full adjustment (additional adjustment for job demands, job control, and baseline health problems, 1.25 [1.08-1.47]). Where data on frequency were available, a stronger association was observed among people with frequent exposure to violence (1.75 [1.27-2.42]) than occasional violence (1.27 [1.04-1.56]). Workplace bullying was also associated with an increased suicide risk (1.32 [1.09-1.59]), but the association was attenuated after adjustment for

baseline mental health problems (1·16 [0·96-1·41]). **Interpretation:** Observational data from three Nordic countries suggest that workplace violence is associated with an increased suicide risk, highlighting the importance of effective prevention of violent behaviours at workplaces. **Funding:** Swedish Research Council for Health, Working Life and Welfare, Academy of Finland, Finnish Work Environment Fund, and Danish Working Environment Research Fund.

**Hanson et al. 2023.**

**The Lancet Public Health, vol. 8, no. 7.**

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**Keywords:** Workplace violence; bullying; suicide risk.

**Evidence Level:** 4B

**Link:** [https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667\(23\)00096-8/fulltext](https://www.thelancet.com/journals/lanpub/article/PIIS2468-2667(23)00096-8/fulltext)

### **Effects of chronic workplace harassment on mental health and alcohol misuse: A long-term follow-up.**

**Background:** Research on the impacts of exposure to workplace harassment (WH) is largely cross-sectional, and existing prospective studies generally are between two and five years of follow-up, with the longest US study being 10 years. However, the effects of exposure to WH may persist longer, particularly if exposure has been chronic. This study fills this gap by examining effects of prior exposure to chronic sexual and generalized WH on psychological distress and alcohol misuse over an approximately 25 year study period.

**Methods:** Individuals originally recruited from a university-employed sample in the United States were surveyed at 8 time points from 1996-2007 and again in 2020-2021. A series of hybrid path analyses were tested on a sample of 2352 individuals, regressing recent outcomes on latent classes of harassment derived from earlier survey waves, controlling baseline outcomes and demographics. Model fit was assessed using a variety of fit statistics, and standardized regression coefficients were used to assess significance of individual pathways. **Results:** Prior exposure to chronic sexual harassment had significant direct associations with psychological distress, alcohol misuse, and recent stressors at follow-up. Prior exposure to chronic generalized harassment had significant direct associations with lower income and alcohol misuse. Both forms of WH were significantly indirectly associated with psychological distress through recent stressors at follow-up. **Conclusions:** Exposure to chronic WH is associated with long-term effects on psychological distress and alcohol misuse in a sample representing a wide variety of job types and racial/ethnic identities. Enforcement of anti-sexual harassment law and policies and enactment of policies and laws to prevent generalized harassment/workplace bullying are imperative for the protection of worker health.

**Rospenda et al. 2023.**

**BMC Public Health, vol. 23, no. 1.**

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**Keywords:** Alcohol misuse; generalized workplace harassment; mental health; occupational stress; sexual harassment; workplace bullying.

**Evidence Level:** 4B

**Link:** <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-023-16219-0>

## **Psychosocial Issues**

*This month we explore the relationship between quality of life at work and burnout, psychosocial risk factors and burnout, social support and social identification on perceived stress, and life satisfaction, work and family conflicts and depression, the influence of psychosocial safety climate on occupational health and safety, the effects of psychological disconnectedness and cynicism on employee performance, and wellbeing. In Covid related research, we explore job loss and psychological distress, the impact of work-life balance on stress, and the effect of perceived stress for work engagement in volunteers.*

### **The effect of perceived stress for work engagement in volunteers during the COVID-19 pandemic: The mediating role of psychological resilience and age differences.**

**Background:** Volunteers played an important role throughout the COVID-19 pandemic. **Methods:** This study investigated the characteristics of perceived stress, psychological resilience and work engagement among 910 Chinese volunteers of different ages in the first month of pandemic in Gansu province, China. The present study tested the correlations between perceived stress and work engagement, the mediating role of psychological resilience in the relationship and the differences among age groups. **Results:** The results of this study showed that work engagement and psychological resilience increased with the age of the volunteers. Work engagement and resilience levels were higher in middle adulthood than in early adulthood. As predicted, perceived stress negatively predicted work engagement. A mediation analysis showed that psychological resilience partially explained the correlations between perceived stress and work engagement. Specifically, the mediating effect of psychological resilience in early adulthood was significant, but not in middle adulthood. Overall, this study demonstrates that work engagement increased with age and was negatively predicted by perceived stress, showing these factors were important for volunteers' work during COVID-19. **Conclusions:** Further, for those in early adulthood, psychological resilience mediated this relationship-highlighting another age difference among volunteers during COVID-19.

**Li et al. 2023.**

**PeerJ, vol. 11.**

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**Keywords:** COVID-19; perceived stress; psychological resilience; volunteers; work engagement.

**Evidence Level:** 5B

**Link:** <https://peerj.com/articles/15704/>

### **Quality of life at work and burnout in family health strategy workers.**

**Background:** To analyze the correlation between quality of life at work and Burnout in workers in the Family Health Strategy. **Methods:** Correlational, cross-sectional study carried out with 112 workers, in the pandemic period (October/2020 to June/2021), in Palmas/Tocantins. The Quality of Work Life Assessment Questionnaire (QWLQ-bref) and the Maslach Burnout Inventory - Human Services Survey (MBI-HSS) were used. **Results:** A strong negative correlation was identified between Emotional Exhaustion and the Physical/Health, Professional and Total Quality of Life Score at work; and moderate negative correlation between Depersonalization and all domains of Quality of Work Life. Professional Achievement showed a moderate positive correlation with the Psychological and Personal domains and with the Total Quality of Work Life Score. **Conclusion:** The best Quality of Work Life indices were correlated with lower Emotional Exhaustion and Depersonalization scores and higher scores of Professional Achievement.

**Borges et al. 2023.**

**Revista Gaúcha de Enfermagem, vol. 44.**

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**Keywords:** Quality of life; burnout; health strategy workers.

**Evidence Level:** 4B

**Link:** <https://www.scielo.br/j/rgenf/a/XJhVWLfTDbcPDHN7WQPP5gR/?lang=en>

### **The role of social support and social identification on challenge and threat cognitive appraisals, perceived stress, and life satisfaction in workplace employees.**

**Background:** There is an emergent literature highlighting the positive role of social support and social identification in buffering against the deleterious effects of psychological stressors. Yet, we have limited understanding of how exactly these social factors fit within contemporary stress and coping theory. To advance and gain a greater understanding of these social factors, we explore the associations of social support and social identification on individuals' challenge and threat cognitive appraisals and how this then relates to perceived stress, life satisfaction, turnover intentions, and job performance. **Methods:** A total of 412 workplace employees from private and public sector occupations completed state measures around a recent most stressful experience at work. **Results:** Results revealed atemporal associations between



cognitive resource appraisals with both social support and social identification. Specifically, greater identification with colleagues and lower threat were related to less perceived stress, while having greater social identification (with colleagues and organisation), social support, and lower threat, were related to greater life satisfaction. Greater perceived stress, and lower social identification and life satisfaction, were also related to greater turnover intentions. While greater identification with the organisation and life satisfaction, along with lower perceived stress were related to greater job performance. **Conclusions:** Taken together, this research provides evidence that social support and social identification play a positive role when trying to promote more adaptive responses to stressful situations.

**Gillman et al. 2023.**

**PLoS One, vol. 18, no. 7.**

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**Keywords:** Social support; life satisfaction; workplace; employees.

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0288563>

### **Work and family conflicts, depression, and "ikigai": A mediation analysis in a cross-cultural study between Japanese and Egyptian civil workers.**

**Background:** Total work-family conflicts (TWFCs) could associate with mental health, and having ikigai (a purpose of life) may mediate this association. **Methods:** In a cross-cultural study of 4,792 Japanese Aichi Workers' Cohort study participants and 3,109 Egyptian civil workers, the Midlife Development in the United States (MIDUS) questionnaire measured TWFCs and the Center for Epidemiological Studies Depression (CES-D) 11-item scale measured depression. We used logistic regression models to estimate odds ratios (ORs) of having depression and a high-ikigai across levels of TWFCs (low, moderate, and high), and the PROCESS macro of Hayes to test the mediation effect. **Results:** The prevalence of high TWFCs, depression, and having a high ikigai were 17.9%, 39.4%, and 70.1% in Japanese women, 10.5%, 26.8%, and 70.1% in Japanese men, 23.7%, 58.2%, and 24.7% in Egyptian women, and 19.1%, 38.9%, and 36.9% in Egyptian men, respectively. Compared with participants with low TWFCs, the multivariable ORs of depression in Japanese women and men with high TWFCs were 4.11 (95% confidence interval [CI], 2.99-5.65) and 5.42 (95% CI, 4.18-7.02), and those in Egyptian women and men were 4.43 (95% CI, 3.30-5.95) and 4.79 (95% CI, 3.53-6.48), respectively. The respective ORs of having a high-ikigai were 0.46 (95% CI, 0.33-0.64) and 0.40 (95% CI, 0.31-0.52) in Japanese women and men and were 0.34 (95% CI, 0.24-0.48) and 0.28 (95% CI, 0.20-0.39) in Egyptian women and men. No interaction between TWFCs and country was observed for the associations with depression or ikigai. Ikigai mediated (up to 18%) the associations between the TWFCs and depression, especially in Egyptian civil workers. **Conclusion:** TWFCs were associated with depression, and having low ikigai mediated these associations in Japanese and Egyptian civil workers.

**Eshak et al. 2023.**

**Journal of Epidemiology, vol. 33, no. 7.**

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**Keywords:** Egypt; Japan; civil workers; cross-cultural study; depression; ikigai; work-family conflict.

**Evidence Level:** 4B

**Link:** [https://www.jstage.jst.go.jp/article/jea/33/7/33\\_JE20210338/article](https://www.jstage.jst.go.jp/article/jea/33/7/33_JE20210338/article)

### **Psychosocial risk and protective factors associated with burnout in police officers: A systematic review.**

**Background:** The specific factors that may influence burnout levels in police officers are not yet clear. Our aim was to systematically identify the psychosocial risk and protective factors associated with burnout among police officers. **Methods:** This systematic review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA). A protocol was registered in PROSPERO. A search strategy was applied to Medline via OvidSP, PsycInfo, Scopus and Web of Science. The quality assessment entailed the use of the CASP checklist for cohort studies. The data was reported through a narrative synthesis. **Results:** After removing studies based on the selection criteria, 41 studies were included in this review. The findings were synthesized under the following subheadings: socio-demographic factors; organisational factors; operational factors; personality variables and coping strategies.

Organisational and operational factors were found to be the most predominant risk factors for burnout. Personality variables and coping strategies appeared as both risk and protective factors. Socio-demographic factors were weak in explaining burnout. **Limitations:** Most studies are from high-income countries. Not all used the same burnout measurement tool. All relied on self-reported data. Since 98 % had a cross-sectional design, causal inferences could not be made. **Conclusions:** Burnout, despite being strictly defined as an occupational phenomenon, is related to factors outside of this context. Future research should focus on examining the reported associations by using more robust designs. More attention must be paid to police officers' mental health by investing in developing strategies to mitigate adverse factors and maximise the effects of protective factors.

**Alves et al. 2023.**

**Journal of Affective Disorders, vol. 332.**

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**Keywords:** Burnout; police officers; protective factors; psychosocial factors; risk factors; systematic review.

**Evidence Level:** 1A

**Link:** <https://www.sciencedirect.com/science/article/pii/S0165032723004354?via%3Dihub>

### **Influence of psychosocial safety climate on occupational health and safety: A scoping review.**

**Background:** Creating a healthy, decent and safe workplace and designing quality jobs are ways to eliminate precarious work in organisations and industries. This review aimed at mapping evidence on how psychosocial safety climate (PSC) influence health, safety and performance of workers. **Methods:** A literature search was conducted in four main databases (PubMed, Scopus, Central and Web of Science) and other online sources like Google Scholar. A reference list of eligible studies was also checked for additional papers. Only full-text peer-reviewed papers published in English were eligible for this review. **Results:** A search in the databases produced 13,711 records, and through a rigorous screening process, 93 papers were included in this review. PSC is found to directly affect job demands, job insecurity, effort-reward imbalance, work-family conflict, job resources, job control and quality leadership. Moreover, PSC directly affects social relations at work, including workplace abuse, violence, discrimination and harassment. Again, PSC has a direct effect on health, safety and performance outcomes because it moderates the impact of excessive job demands on workers' health and safety. Finally, PSC boosts job resources' effect on improving workers' well-being, safety and performance. **Conclusion:** Managers' efforts directed towards designing quality jobs, prioritising the well-being of workers, and fostering a bottom-up communication through robust organisational policies, practices, and procedures may help create a high organisational PSC that, in turn, promotes a healthy and decent work environment.

**Amoadu et al. 2023.**

**BMC Public Health, vol. 23, no. 1.**

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**Keywords:** Job demand; job resources; occupational health and safety; PSC; scoping review.

**Evidence Level:** 6A

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-16246-x>

### **Remote, disconnected, or detached? Examining the effects of psychological disconnectedness and cynicism on employee performance, wellbeing, and work-family interface.**

**Background:** Owing to the COVID-19 pandemic, organizations worldwide have implemented remote working arrangements that have blurred the work-family boundaries and brought to the forefront employees' sense of disconnectedness from their workplace (i.e., organizational disconnectedness) as a concern for multiple organizational outcomes. Cynicism, a job burnout subdimension, refers to a negative and excessively detached response to relational overload at work. While both workplace disconnectedness and cynicism involve a toxic sense of detachment, they refer to different psychological mechanisms.

**Methods:** The present study aims to examine how employee workplace disconnectedness differs from their cynicism, and how both constructs differentially exert their detrimental effects on employee performance, work-family interface, and wellbeing. Using anonymous survey data collected online in 2021 and 2022 from

a sample of in-person and flexible workers nested within organizations, conceptual distinctiveness between workplace disconnectedness and cynicism was supported. **Results:** Measurement invariance across the two groups was supported, and subsequent structural invariance analyses suggested a similar pattern of results for flexible and in-person workers. Specifically, compared to disconnectedness, cynicism exerted higher negative effects on mental health and higher positive effects on cognitive failures and family-to-work conflict. Conversely, compared to cynicism, disconnectedness exerted higher negative effects on performance and work-to-family conflict. That is, feeling indifferent toward others particularly affects mental health and errors, while feeling excluded especially hampers productivity and family life. **Conclusions:** Theoretical and practical (e.g., inclusive leadership, support groups) implications of these results are discussed in light of the globally rising rates of hybrid work arrangements and related costs for employee wellbeing and productivity.

**Petitta et al. 2023.**

**International Journal of Environmental Research and Health, vol. 20, no. 13.**

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**Keywords:** Cynicism; in-person and flexible workers; performance; wellbeing; workplace disconnectedness; work–family interface.

**Evidence Level:** 4B

**Link:** <https://www.mdpi.com/1660-4601/20/13/6318>

**Job loss and psychological distress during the COVID-19 pandemic: A national prospective cohort study.**

**Background:** The COVID-19 pandemic caused substantial increases in unemployment; however, the association between these job losses and psychological distress is not well documented. Our study reports on this association from a cohort study, with a particular focus on educational differences in both the likelihood of job loss and its potential implications for mental health. **Methods:** Utilizing data from a large prospective cohort study of parents in Norway (n = 58,982), we examined changes in psychological distress within four groups of respondents: those who during the first wave of COVID-19 had (i) no change in their employment situation, (ii) worked from home, (iii) been furloughed, or (iv) lost their job.

**Results:** Psychological distress increased in all groups. In z-scores relative to pre-pandemic levels, the increases were (i) 0.47 [95%-CI: 0.45-0.49] among respondents with no change in their employment situation, (ii) 0.51 [95%-CI: 0.49-0.53] among respondents who worked from home, (iii) 0.95 [95%-CI: 0.91-0.99] among those furloughed, and (iv) 1.38 [95%-CI: 1.16-1.59] among those who permanently lost their job, corresponding to increases of 89%, 95%, 170%, and 185%, respectively. While respondents without university education had a 2 to 3 times higher risk of job loss, the negative impact of job loss on psychological distress was similar across educational levels. **Conclusions:** Participants exposed to job loss during the pandemic experienced a stronger increase in symptoms of depression or anxiety compared to those who remained employed. Although higher education lowered the risk of losing work, it did not substantially diminish the impact on mental health from losing work.

**Wörn et al. 2023.**

**BMC Public Health, vol. 23, no. 1.**

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**Keywords:** COVID-19; job loss; mental health; social inequality.

**Evidence Level:** 4B

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-16303-5>

**How does the work-life balance impact stress on primary healthcare workers during the COVID-19 pandemic?**

**Background:** Most studies in advanced care settings reported that the increasing workload increases the work-life imbalance and harms the mental health of health workers. The COVID-19 Pandemic's tracing, testing, treatment, and mass vaccination also have multiplied the primary healthcare workers' workload. Nevertheless, studies on primary care workers are scarce. This study aimed to investigate how the COVID-19-related work-life balance impact stress on primary healthcare workers in the third years of the pandemic. **Methods:** The study was a cross-sectional, web-based survey conducted on primary healthcare

workers in Kediri Regency, Indonesia, with the highest Omicron case surge worldwide. It was conducted right after the surge between July and August 2022, the third year of the COVID-19 pandemic hit Indonesia. Under coordination with the local government health officials, primary healthcare workers were invited to participate in an online survey. The respondents were asked to evaluate their sociodemography, work conditions, personal life, and perceived stress (using the Perceived Stress Scale) during the pandemic. Their work-life balance was evaluated using the Work/Non-work Interference and Enhancement Scale. We used several hierarchical linear regression models to determine which variables contribute to work stress among primary healthcare workers. **Results:** Sociodemographic characteristics, including gender, age, marital status, years of professional experience, and educational level, were not significantly associated with stress levels among our respondents. Separately, work conditions and personal life variables did not associate with stress levels. However, primary healthcare workers' work and personal lives interfere with each other during the pandemic and are associated with their higher stress. **Conclusion:** During the pandemic, the work life of primary health workers interferes with their personal life more than the interference of personal life on their work life. At the same time, the work life's enhancement on the personal life and vice versa were lower than its interference. Those conditions are associated with higher perceived stress of primary health workers.

**Putri et al. 2023.**

**BMC Health Services Research, vol. 23, no. 1.**

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**Keywords:** COVID-19 pandemic; mental health; primary healthcare; stress; work-life balance.

**Evidence Level:** 4B

**Link:** <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-023-09677-0>

## Fostering Work Participation

### Return to Work

*This month we explore the relationship between return to work and psychosocial work factors and work-home interference, depression, anxiety and stress, and level of education.*

#### **Are psychosocial work factors and work-home interference associated with time to first full return-to-work after sick leave due to common mental disorders?**

**Background:** To (1) examine the time to first full return-to-work (RTW), and (2) investigate whether psychosocial work factors and work-home interference are associated with time to first full RTW after sick leave due to common mental disorders (CMDs). **Methods:** The cohort study comprised 162 employees on sick leave due to CMDs participating in a two-armed cluster-randomised controlled trial in Sweden.

Baseline data consisted of a web-based questionnaire and follow-up data of repeated text messages every fourth week for 12 months. The time to first full RTW was estimated using the Kaplan-Meier Estimator. Parametric Weibull survival models with interval-censored outcomes were used to determine associations between psychosocial work factors and work-home interference with time to first full RTW. In a post hoc analysis, time-interval differences in associations for 0- ≤ 6- versus > 6-12 months were tested.

**Results:** During the 12-month follow-up, n = 131 (80.9%) reported a first full RTW. The median time to this RTW was 16 weeks (95% CI 12; 20). High psychological job demands, high emotional job demands, high work-to-home interference (WHI), and low social job support were independently associated with a longer time to first full RTW. Time-interval differences were found for job control and emotional job demands.

**Conclusions:** Psychosocial work demands and WHI are associated with a longer time to RTW after sick leave due to CMDs. Work organisations and rehabilitation practices should include accommodations for high psychological and emotional job demands during RTW, as well as pay attention to the risk of spill-over of high job demands into employees' private lives.

**Holmlund et al. 2023.**

**International Archives of Occupational and Environmental Health, vol. 96, no. 5.**

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**Keywords:** Determinants; mental disorders; return to work; sickness absence; survival analysis; work factors.

**Evidence Level:** 2B

**Link:** <https://link.springer.com/article/10.1007/s00420-023-01970-z>

**Predictors of return to work for people on sick leave with depression, anxiety and stress: Secondary analysis from a randomized controlled trial.**

**Background:** Knowledge about predictors of return to work (RTW) in people on sick leave with common mental disorders (CMDs) may inform the development of effective vocational rehabilitation interventions for this target group. In this study, we investigated predictors of RTW at 6 and 12 months in people on sick leave with depression, anxiety disorders or stress-related disorders. **Methods:** We have performed a secondary analysis, utilizing data from two RCTs that evaluated the efficacy of an integrated health care and vocational rehabilitation intervention. Data were obtained from mental health assessments, questionnaires and registers. Using Cox regression analysis, the relationship between baseline variables and RTW was analysed at 6 and 12 months after randomization within the group of CMD as a whole and within the subgroups of depression, anxiety and stress-related disorders. **Results:** Symptom burden and employment status at baseline predicted RTW in the CMD group (n = 1245) and in the three diagnostic subgroups at both time points. RTW self-efficacy predicted RTW in the depression group but not in the anxiety or stress subgroups. **Conclusion:** Many predictors of RTW were similar over time and, to some extent, across the CMD subgroups. Findings highlight the need not only to take health-related and psychological factors into account when developing vocational rehabilitation interventions but also to consider workplace strategies and options for support.

**Bjørkedal et al. 2023.**

**International Archives of Occupational and Environmental Health, vol. 96, no. 5.**

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**Keywords:** Mental health; occupational rehabilitation; prognostic factors; sickness absence; work participation.

**Evidence Level:** 2B

**Link:** <https://link.springer.com/article/10.1007/s00420-023-01968-7>

**Level of education and sustainable return to work among long-term sick-listed workers with depression: a register-based cohort study (The Norwegian GP-DEP Study).**

**Background:** Sick-listed workers with depression are at higher risk of long-term, recurrent sickness absence and work disability, suggesting reduced likelihood of sustainable return to work (SRTW). Though likelihood of RTW has been associated with education level, less is known about the association over time, post-RTW. We aimed to investigate associations between educational level and SRTW among long-term sick-listed workers with depression. **Methods:** Nationwide cohort study, based on linked data from Norwegian health and population registries, including all inhabitants of Norway aged 20-64 years on long-term sick leave with a depression diagnosis given in general practice between 1 January 2009 and 10 April 2011 (n=13.624, 63.7% women). Exposure was the highest attained education level (five groups). Three outcome measures for SRTW were used, with 0 days,  $\leq 30$  days and  $\leq 90$  days of accumulated sickness absence post-RTW during a 2-year follow-up. Associations between exposure and outcomes were estimated in gender-stratified generalised linear models, adjusting for sociodemographic factors and duration of sick leave.

**Results:** Higher-educated workers had a higher likelihood of SRTW 0, SRTW  $\leq 30$  and SRTW  $\leq 90$  than the lowest-educated groups in the crude models. Among men, this association was mainly explained when adjusting for occupation. Among women, the highest educated group had a higher likelihood of SRTW 0 (RR=1.45, 95% CI 1.23 to 1.71) and SRTW  $\leq 30$  and SRTW  $\leq 90$  in the fully adjusted models. **Conclusions:** An educational gradient in SRTW was mainly explained by occupation among men but not among women. These findings suggest gendered differences in associations between education level and SRTW, which could inform interventions aiming to promote equal opportunities for SRTW.

**Meling et al. 2023.**

**BMJ Open, vol. 13, no. 7.**

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**Keywords:** Depression and mood disorders; health equity; mental health; public health; registries.

**Evidence Level:** 4B

**Link:** <https://bmjopen.bmj.com/content/13/7/e072051.long>

## Presenteeism and Absenteeism

*This month we explore the relationship between sickness absence and work-related stress, psychosocial and organisational work factors, social and health-related factors, idiopathic inflammatory rheumatic diseases and acute myocardial infarction.*

### **Work-related stress, reason for consultation and diagnosis-specific sick leave: How do they add up?**

**Background:** Work-related stress is common in Western society and disorders associated with stress are often managed in primary health care. This study was set to increase the understanding of the relationship between reason for consultation, work-related stress and diagnosis-specific sick leave for primary health care patients. **Methods:** The longitudinal observational study included 232 employed non-sick listed patients at seven primary health care centres in Sweden. Of these patients, 102 reported high work-related stress, as measured with the Work Stress Questionnaire, and 84 were on registered sick leave within one year after inclusion. **Results:** The study showed that, compared to those who did not report high work-related stress, highly stressed patients more often sought care for mental symptoms (60/102 versus 24/130), sleep disturbance (37/102 versus 22/130) and fatigue (41/102 versus 34/130). The risk for sick leave with a mental diagnosis within a year after base-line was higher among patients reporting high work-related stress than among those who did not (RR 2.97, 95% CI 1.59;5.55). No such association was however found for the risk of sick leave with a musculoskeletal diagnosis (RR 0.55, 95% CI 0.22;1.37). Seeking care for mental symptoms, sleep disturbance and fatigue were associated with having a future mental sick leave diagnosis ( $p$ -values < 0.001), while seeking care for musculoskeletal symptoms was associated with having a future musculoskeletal sick leave diagnosis ( $p$ -value 0.009). In summary, compared to those who did not report high work-related stress, patients with high work-related stress more often sought care for mental symptoms, sleep disturbance and fatigue which lead to a mental sick leave diagnosis.

**Conclusions:** Reporting high work-related stress was, however, not linked to having sought care for musculoskeletal symptoms nor future sick leave due to a musculoskeletal diagnosis. Hence, both patients and general practitioners seem to characterize work-related stress as a mental complaint.

**Hultén et al. 2023.**

**PLoS One, vol. 18, no. 7.**

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**Keywords:** Work-related stress; sick leave; primary health care.

**Evidence Level:** 4B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0288751>

### **Psychosocial and organisational work factors as predictors of sickness absence among professionally active adults with common mental disorders.**

**Background:** The incidence of sickness absence (SA) due to common mental disorders (CMDs) has increased in recent decades. It is hence important to elucidate how individuals with CMDs can maintain work. The aim was to analyse the relationship between psychosocial and organisational workplace factors and a spell of > 14 days of SA among persons with CMDs. **Methods:** Included were respondents of the Swedish Work Environment Survey (SWES) 1993-2013, diagnosed with a CMD up to five years before the interview in the SWES ( $n = 3,795$ ). Relative Risk (RR) regression models with 95% Confidence Intervals (CIs) analysed associations between psychosocial-, and organisational workplace factors and a subsequent spell of SA > 14 days. **Results:** Low control over work (RR:1.16; CI:1.01-1.35), job strain (RR:1.25; CI:1.04-1.49), no flexible working hours (RR:1.25; CI:1.08-1.45) or no possibility to work from home (RR:1.37; CI:1.13-1.66) were significantly related to an increased risk of SA. Persons diagnosed with depression experiencing job strain had the highest increased risk of SA (RR:1.55; CI: 1.07-2.25). **Conclusions:** A sustainable work-life

among working individuals with CMDs can be provided by reducing job strain, and if possible, by increasing flexibility regarding workplace and working hours. This may prevent spells of SA, and hereby increase productivity.

**Helgesson et al. 2023.**

**BMC Psychiatry, vol. 23, no. 1.**

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**Keywords:** Common mental disorder (CMD); ill health; psychosocial and organisational working conditions; sick leave.

**Evidence Level:** 4B

**Link:** <https://bmcp psychiatry.biomedcentral.com/articles/10.1186/s12888-023-05020-3>

### **Long-term sickness absence trajectories among ageing municipal employees: The contribution of social and health-related factors.**

**Background:** The ageing work force is heterogeneous, following distinct development in work ability. This study aims to identify trajectories of long-term sickness absence (SA) in later careers and to examine potentially modifiable factors associated with the development of SA. **Methods:** Data comprised of municipal employees of the city of Helsinki aged 50-60 years during 2004-2018 (N = 4729, 80% women). The developmental trajectories of long-term (> 10 working days) SA were examined with Group-based trajectory modelling (GBTM) using SA records of the Social Insurance Institution of Finland during 2004-2018. All-cause and diagnosis-specific (mental disorder- and musculoskeletal disease-related) SA days were analysed. The association of social and health-related factors with trajectory membership was examined using multinomial logistic regression (odds ratios and 95% confidence intervals). **Results:** A model with three trajectories was selected for both all-cause and diagnosis-specific SA. Regarding all-cause long-term SA trajectories, 42% had no long-term SA, 46% had low levels of SA, and 12% had a high rate of SA during follow-up. Lower occupational class, reporting smoking, overweight or obesity, moderate or low leisure-time physical activity, and sleep problems were associated with a higher likelihood of belonging to the trajectory with a high rate of SA in both all-cause and diagnosis-specific models. **Conclusions:** Most ageing employees have no or little long-term SA. Modifiable factors associated with trajectories with more SA could be targeted when designing and timing interventions in occupational healthcare.

**Suur-Uski et al. 2023.**

**BMC Public Health, vol. 23, no. 1.**

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**Keywords:** Ageing; cohort study; health behaviour; sick leave; sickness absence; trajectories; work arrangements.

**Evidence Level:** 4B

**Link:** <https://bmcp public health.biomedcentral.com/articles/10.1186/s12889-023-16345-9>

### **Burden of idiopathic inflammatory rheumatic diseases in occupational healthcare: Increased absenteeism and healthcare resource utilization.**

**Background:** Patients with idiopathic inflammatory rheumatic diseases (IIRD) often have decreased working capacity resulting in indirect costs. However, data on patients' short-term sick leave has been limited. This retrospective cohort study evaluated the number and length of sick leave, including short-term leave, and occupational healthcare resource utilization (HCRU) of the working-aged patients with IIRD compared to controls. **Methods:** The data on sick leave and occupational HCRU were gathered from the electronic medical records of the largest occupational healthcare provider in Finland from January 2012 to December 2019. Employed patients with an IIRD (including rheumatoid arthritis, spondyloarthritis, psoriatic and enteropathic arthritis, juvenile arthritis, and reactive arthritis) with at least a 12-months follow-up were identified and compared to age-, sex-, and follow-up matched controls without IIRD. **Results:** Altogether 5405 patients with IIRD were identified and compared with an equal number of controls. The patients incurred approximately 2.5 times more sick leave than controls: 21.7 versus 8.5 days per patient year, respectively. Short-term sick leave was common: 83% of sickness absence periods of the patients lasted 1-9 days and represented 30% of the total absenteeism. Loss of productivity due to lost workdays was on

average €4572 (95% confidence interval €4352-4804) per patient year. Occupational HCRU was approximately 1.8 times higher among IIRD patients than controls. **Conclusions:** Workers with an IIRD incur considerably more sick leave and use more occupational healthcare services than controls. Short sick leave not registered in national insurance registers constitute a significant portion of days off work among patients with IIRD.

**Ukkola-Vuoti et al. 2023.**

**Scandinavian Journal of Work, Environment and Health, vol. 49, no. 5.**

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**Keywords:** Idiopathic inflammatory rheumatic diseases; occupational healthcare; absenteeism; healthsre resource.

**Evidence Level:** 4B

**Link:** <https://www.sjweh.fi/article/4095>

### **Evaluation of a structuralized sick-leave programme compared with usual care sick-leave management for patients after an acute myocardial infarction.**

**Background:** To compare a structuralized sick-leave programme with usual care sick-leave management in patients after an acute myocardial infarction. We hypothesize that a structured sick-leave programme will yield a faster return to work without negatively affecting quality of life. **Methods:** Patients admitted to Oslo University Hospital due to an acute myocardial infarction were included in the study. Patients were randomized into an intervention group or a conventional care group. Patients randomized to the intervention group were provided with a standard programme with full-time sick leave for 2 weeks after discharge and then encouraged to return to work. The sick leave of the conventional group was mainly managed by their general practitioner. **Results:** A total of 143 patients were included in the study. The conventional care group had a mean of 20.4 days absent from work, while that of the intervention group was significantly lower, with a mean of 17.2 days ( $p < 0.001$ ) absent. There was no significant change in quality of life between the groups. **Conclusion:** These findings strengthen the case for structuralized follow-up of patients with acute myocardial infarction, as this will have positive economic consequences for the patient and society as a whole, without making quality of life worse. Further investigation, with a larger study population, is warranted to determine the extent of health benefits conferred by early return to work.

**Tjessum et al. 2023.**

**Journal of Rehabilitation Medicine, vol. 24.**

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**Keywords:** Sick leave; myocardial infarction; sick leave management.

**Evidence Level:** 3B

**Link:** <https://medicaljournalssweden.se/jrm/article/view/4569>

## **Workers Compensation**

*This month we explore the relationship between workers' compensation claims and work-related traumatic spinal cord injury, and cannabis use.*

### **Epidemiology of work-related traumatic spinal cord injury: An analysis of workers' compensation claims in Korea, 2011-2019.**

**Background:** We aimed to identify the incidence and burden of work-related traumatic spinal cord injury (wrTSCI) in Korea in the 10-year period from 2010 to 2019. **Methods:** We used nationwide workers' compensation insurance data. The study population comprised industrially injured workers with TSCI diagnosis codes. The annual incidence of wrTSCI (number per million workers) was calculated.

**Results:** The mean annual incidence of wrTSCI was 22.8/1,000,000 (95% confidence interval, 20.5 to 25.0), and the mean total cost per claim was 231.40 million KRW. The incidence of TSCI in the cervical region was the highest (13.1/1,000,000; 95% confidence interval, 11.4 to 14.9), and most cases were in the



construction industry (47.3%). **Conclusion:** These findings can help identify specific at-risk groups and facilitate the development of prevention strategies.

**Bae et al. 2023.**

**Journal of Occupational and Environmental Medicine, vol. 65, no. 7.**

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**Keywords:** Epidemiology; spinal cord injury; workers' compensation claims.

**Evidence Level:** 4B

**Link:**

[https://journals.lww.com/joem/Fulltext/2023/07000/Epidemiology\\_of\\_Work\\_Related\\_Traumatic\\_Spinal\\_Cord.16.aspx](https://journals.lww.com/joem/Fulltext/2023/07000/Epidemiology_of_Work_Related_Traumatic_Spinal_Cord.16.aspx)

### **Cannabis use among workers with work-related injuries and illnesses: Results from a cross-sectional study of workers' compensation claimants in Ontario, Canada.**

**Background:** Little is known about how workers use cannabis following a work-related injury/illness, including whether they receive clinical guidance. The objective was to compare characteristics of workers using and not using cannabis after a work-related injury/illness and describe use patterns.

**Design:** Cross-sectional study. **Setting and participants:** Workers who experienced a work-related physical injury/illness resulting in one or more days of lost time compensated by the workers' compensation authority in Ontario, Canada (n=1196). **Methods:** Participants were interviewed 18 or 36 months after their injury/illness. Participants were asked about their past-year cannabis use, including whether use was for the treatment of their work-related condition. Sociodemographic, work and health characteristics were compared across cannabis groups: no past-year use; use for the work-related condition; use unrelated to the work-related condition. Cannabis use reasons, patterns, perceived impact and healthcare provider engagement were described. **Results:** In total, 27.4% of the sample reported using cannabis (14.1% for their work-related condition). Workers using cannabis for their condition were less likely to be working (58.0%) and more likely to have quite a bit/extreme pain interference (48.5%), psychological distress (26.0%) and sleep problems most/all the time (62.1%) compared with those not using cannabis (74.3%, 26.3%, 12.0% and 38.0%, respectively) and those using cannabis for other reasons (74.2%, 19.5%, 12.0% and 37.1%, respectively) (all p<0.0001). No significant differences were observed in medical authorisations for use among those using cannabis for their condition (20.4%) or unrelated to their condition (15.7%) (p=0.3021). Healthcare provider guidance was more common among those using cannabis for their condition (32.7%) compared with those using for other reasons (17.1%) (p=0.0024); however, two-thirds of this group did not receive guidance. **Conclusions:** Cannabis may be used to manage the consequences of work-related injuries/illnesses, yet most do not receive clinical guidance. It is important that healthcare providers speak with injured workers about their cannabis use.

**Carnide et al. 2023.**

**BMJ Open, vol. 13, no. 7.**

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**Keywords:** Epidemiologic studies; occupational and industrial medicine; public health.

**Evidence Level:** 4B

**Link:** <https://bmjopen.bmj.com/content/13/7/e072994.long>

## **Working hours**

*This month we explore the relationship between long working hours and risk of lean non-alcoholic fatty liver disease, and general anxiety.*

### **Long working hours and increased risks of lean non-alcoholic fatty liver disease among Korean men and women.**

**Background:** Despite the increasing prevalence of lean nonalcoholic fatty liver disease (NAFLD), its risk factors are not well established. We examined the association between long working hours and incident

NAFLD in lean Korean workers with emphasis on sex-based effect modification. **Methods:** This cohort study involved 46,113 non-overweight (BMI < 23 kg/m<sup>2</sup>) and NAFLD-free Korean workers (mean age, 35.5 years). Working hours were categorized into 35-40 (reference), 41-52, and ≥ 53 h. The presence of fatty liver and its severity were determined using ultrasonography and NAFLD fibrosis score (NFS), respectively. Hazard ratios (HRs) and 95% confidence intervals (CIs) were estimated using parametric proportional hazards models. **Results:** Incident cases of 5901 lean NAFLD developed over a median follow-up of 3.8 years. The incidence of lean NAFLD increased with increasing working hours with a stronger association in men than in women (P for interaction < 0.001). For men, multivariable-adjusted HRs (95% CIs) for lean NAFLD in time-dependent models comparing working hours of 41-52 and ≥ 53 h compared to the reference category were 1.17 (1.07-1.28) and 1.25 (1.12-1.39), respectively. The excess relative risk of developing lean NAFLD with intermediate/high NFS was observed in working hours of 41-52 and ≥ 53 h with a corresponding HR of 1.66 (1.13-2.43) and 1.54 (0.94-2.51), respectively. Conversely, no significant associations were found between working hours and incidence of lean NAFLD in women. **Conclusions:** In conclusion, long working hours were significantly associated with an increased incidence of lean NAFLD and its severe form in men but not in women.

**Lim et al. 2023.**

**Scientific Reports, vol. 13, no. 1.**

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**Keywords:** Working hours; fatty liver disease; non-alcoholic.

**Evidence Level:** 4B

**Link:** <https://www.nature.com/articles/s41598-023-39154-x>

### **Work addiction in Chinese white-collar workers: The psychometric properties of its measure and its comorbidity with general anxiety in network analysis.**

**Background:** Work addiction (WA) threatens occupation-related health in many countries including China. This research aims to evaluate the psychometric properties of the Chinese version of Bergen Work Addiction Scale (BWAS), the most common measure of WA, to facilitate relevant studies in Chinese workers. A network analysis was further conducted to identify central and bridge symptoms within the WA-anxiety network to improve intervention practices. **Methods:** A total of 694 Chinese white-collar workers completed an online questionnaire survey in March of 2022, and the responses to BWAS from a subsample of 50 participants one month after this survey were also collected. **Results:** The unidimensionality of BWAS was supported by results of exploratory factor analysis, exploratory graph analysis, and confirmatory factor analysis and we found satisfactory internal consistency and acceptable test-retest reliability. Multiple-group factor analyses confirmed the measurement invariance of BWAS across genders, districts (i.e., central China, eastern China, western China, and northeastern China), and age groups (i.e., young and middle-aged adults) while the convergent validity of BWAS was demonstrated by its significant correlations with Dutch Work Addiction Scale ( $r = 0.62$ ,  $p < 0.001$ ) and its criterion validity was indicated by its significant correlations with general anxiety, weekly work hours, and health status ( $r = -0.16$  to  $0.31$ ,  $p < 0.001-0.01$ ). Network analysis further revealed two central symptoms (WA-tolerance and WA-problems) and three bridge symptoms (WA-problems, WA-mood modification, and mouth dryness of general anxiety) maintaining the WA-anxiety comorbidity. **Conclusions:** Our findings suggest that BWAS is a valid measure of WA in Chinese workers and interventions should put special attention to the identified central and bridge symptoms underlying the WA-anxiety network.

**Sun et al. 2023.**

**BMC Psychology, vol. 11, no. 1.**

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**Keywords:** Anxiety; Bergen Work Addiction Scale; network analysis; psychometric properties; work addiction; workaholism.

**Evidence Level:** 4B

**Link:** <https://bmcpyschology.biomedcentral.com/articles/10.1186/s40359-023-01247-7>

## Wellness Programs

*This month we explore the workplace wellness programs associated with workplace health promotion, healthy eating, alcohol prevention, and cardiovascular disease prevention. In Covid related research, we explore the utilisation of employee assistance programs during the pandemic.*

### **Health and wellness in the Australian coal mining industry: An analysis of pre-post findings from the RESHAPE workplace health promotion program.**

**Background:** Non-communicable diseases are the leading cause of death worldwide, accounting for 71% of deaths in 2021. The chronic and pervasive nature of these diseases spurs the need for novel treatment approaches, including using the workplace as a front for the promotion and dissemination of health messages and activities. Taking this into consideration, this study aimed to assess the efficacy of a workplace health promotion program that targeted nutrition, physical activity, and obesity outcomes in a New South Wales (NSW) coal mine site. **Design:** A 12-week quasi-experimental pre-test-post-test study.

**Setting:** A coal mine site in rural NSW, Australia. **Participants:** At baseline there were  $n = 389$  participants, with similar numbers at follow-up ( $n = 420$ ) as well as 61 participants from both timepoints (8.2% repeated measures), with 89% of participants being male. **Intervention:** A multicomponent wellness intervention was implemented incorporating aspects of education, goal setting, and competition. **Outcomes:** Physical activity, nutrition, and weight. **Results:** The mean BMI at baseline was 30.01 kg/m<sup>2</sup>, and at follow-up 29.79 kg/m<sup>2</sup> ( $p = 0.39$ ). At follow-up, participants reported 81% lower odds of engaging in the exercise category 'no moderate physical exercise' (OR = 0.09,  $p < 0.001$ ), as well as 111% higher odds of meeting physical activity and exercise guidelines (OR = 2.11,  $p = 0.057$ ). There were no changes to diet outcomes and no association between employment characteristics and participating in physical activity.

**Conclusions:** Workplace health promotion programs can be an efficacious strategy in improving physical activity outcomes and marginally improving weight outcomes in those in the mining industry. Further research is needed to determine the true effectiveness of these programs long-term, particularly in an environment as challenging and dynamic as the mining industry.

**Bezzina B et al. 2023.**

**PLoS One, vol. 18, no. 7.**

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**Keywords:** Coal mining; health; wellness; workplace health promotion program.

**Evidence Level:** 3A

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0288244>

### **Healthy eating in the Australian coal mining industry: Assessing the efficacy of the 'out of the box' workplace health promotion program.**

**Background:** Noncommunicable diseases are the world's leading cause of death. To curb the global rise in these diseases, using the workplace as a front to disseminate health communication messages and resources has been suggested. This study aimed to assess the efficacy of a workplace health promotion program, 'Out of the Box', that targeted nutrition outcomes and nutrition guideline knowledge. **Methods:** A 6-month workplace health promotion program was implemented within a coal mine site. Over the 6 months, there were four wellness focus areas, lasting 1 month each, including fruits, vegetables and portion controlling, label reading, alcohol awareness, and hydration promotion. The study utilized a quasi-experimental pre-test-post-test design, with measurements via self-reported paper-based surveys.

**Results:** At baseline there were 163 responses, and 106 at follow-up. At the 6-month follow-up, respondents had increased odds of recalling the current fruit (OR 1.29,  $p = 0.032$ ) and vegetable (OR 1.76,  $p < 0.001$ ) guidelines. Being male was associated with lower vegetable intake (B: -0.28), although this did not reach statistical significance. **Conclusions:** A nutrition-focused workplace health promotion program can be an efficacious strategy in improving knowledge of fruit and vegetable guidelines. Further research is needed to evaluate the effectiveness of these programs over time.

**Bezzina et al. 2023.**

**Nutrients, vol. 15, no. 14.**

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**Keywords:** Coal mining; fruit; health promotion; knowledge; nutrition; occupational health; vegetable.

**Evidence Level:** 3A

**Link:** <https://www.mdpi.com/2072-6643/15/14/3254>

### **Effects of a multi-component alcohol prevention program in the workplace on hazardous alcohol use among employees.**

**Background:** The workplace can be affected negatively by hazardous alcohol use, and intervening at an early stage remains a challenge. Recently, a multi-component alcohol prevention program, Alcohol Policy and Managers' skills Training (hereafter, 'APMaT'), was delivered at the organizational level. In a previous outcome evaluation, APMaT appeared to be effective at the managerial level. The current study takes a step further by aiming to evaluate the effectiveness of APMaT in decreasing the alcohol risk level among employees. **Methods:** Data from 853 employees (control: n = 586; intervention: n = 267) were gathered through a cluster-randomized study. To analyze changes in the odds of hazardous alcohol use among employees, multilevel logistic regression was applied using group (control vs. intervention), time (baseline vs. 12-month follow-up), and the multiplicative interaction term (group × time) as the main predictors. The intervention effect was further adjusted for sociodemographic characteristics and policy awareness.

**Results:** No statistically significant difference was observed in the odds of hazardous alcohol use, although employees in the intervention group showed a larger decrease compared to the control group. This remained even after adjusting for several factors, including the sociodemographic factors and policy awareness. **Conclusions:** The findings are insufficient to determine the effectiveness of APMaT at the employee level at the current stage of the evaluation. Future studies should strive to identify issues with implementation processes in workplace-based alcohol interventions.

**Trial registration:** The trial was retrospectively registered on 11/10/2019; ISCRTN ID: ISRCTN17250048. Elling et al. 2023.

**BMC Public Health, vol. 23, no. 1.**

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**Keywords:** Alcohol prevention; hazardous alcohol use; policy awareness; workplace intervention.

**Evidence Level:** 3A

**Link:** <https://bmcpublihealth.biomedcentral.com/articles/10.1186/s12889-023-16150-4>

### **Cost-effectiveness analysis of implementing polygenic risk score in a workplace cardiovascular disease prevention program.**

**Background:** Polygenic risk score for coronary artery disease (CAD-PRS) improves precision in assessing the risk of cardiovascular diseases and is cost-effective in preventing cardiovascular diseases in a health system and may be cost-effective in other settings and prevention programs such as workplace cardiovascular prevention programs. Workplaces provide a conducive environment for cardiovascular prevention interventions, but the cost-effectiveness of CAD-PRS in a workplace setting remains unknown. This study examined the cost-effectiveness of integrating CAD-PRS in a workplace cardiovascular disease prevention program compared to the standard cardiovascular workplace program without CAD-PRS and no-workplace prevention program. **Methods:** We developed a cohort simulation model to project health benefits (quality-adjusted life years gained) and costs over a period of 5 years in a cohort of employees with a mean age of 50 years. The model health states reflected the risk of disease (coronary artery disease and ischemic stroke) and statin prevention therapy side effects (diabetes, hemorrhagic stroke, and myopathy). We considered medical and lost productivity costs. Data were obtained from the literature, and the analysis was performed from a self-insured employer perspective with future costs and quality-adjusted life years discounted at 3% annually. Uncertainty in model parameter inputs was assessed using deterministic and probabilistic sensitivity analyses. Three programs were compared: (1) a workplace cardiovascular program that integrated CAD-PRS with the pooled cohort equation—a standard of care for assessing the risk of cardiovascular diseases (CardioriskSCORE); (2) a workplace cardiovascular prevention program without CAD-PRS (Standard-WHP); and (3) no-workplace health program (No-WHP). The main outcomes were total costs (US \$2019), incremental costs, incremental quality-adjusted life years, and incremental cost-

effectiveness ratio. **Results:** CardioriskSCORE lowered employer costs (\$53 and \$575) and improved employee quality-adjusted life years (0.001 and 0.005) per employee screened compared to Standard-WHP and No-WHP, respectively. The effectiveness of statin prevention therapy, employees' baseline cardiovascular risk, the proportion of employees that enrolled in the program, and statin adherence had the largest effect size on the incremental net monetary benefit. However, despite the variation in parameter input values, base case results remained robust. **Conclusion:** Polygenic testing in a workplace cardiovascular prevention program improves employees' quality of life and simultaneously lowers health costs and productivity monetary loss for employers.

**Mujwara et al. 2023.**

**Frontiers in Public Health, vol. 11.**

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**Keywords:** Cardiovascular risk factors; cost-effectiveness; polygenic risk score (PRS); prevention; workplace setting.

**Evidence Level:** 5B

**Link:** <https://www.frontiersin.org/articles/10.3389/fpubh.2023.1139496/full>

### **Understanding low utilization of employee assistance programs and time off by US public health workers during the COVID-19 pandemic.**

**Background:** Despite high rates of reported mental health symptoms among public health workers (PHWs) during the COVID-19 pandemic, utilization of employer-offered resources was low. Our objective was to understand what barriers and deterrents exist for PHWs accessing employer-offered resources.

**Methods:** Four national public health organizations disseminated a national online survey of public health department employees during March-April 2021; 26 174 PHWs completed the survey. We examined 5164 write-in survey responses using thematic analysis to identify key reasons why PHWs were not accessing time off and employee assistance programs (EAPs) and to understand what resources PHWs would like to see their employers offer. **Results:** The top reasons that PHWs reported for not taking time off during the COVID-19 pandemic were financial concerns (24.4%), fear of judgment or retaliation (20.8%), and limitations in the amount of time off offered or available (11.0%). The top reasons that PHWs reported for not using EAPs during the COVID-19 pandemic were difficulty accessing EAPs (53.1%), use of external services (21.5%), and a lack of awareness about EAPs or motivation to initiate their use (11.3%). While desired employer-offered resources varied widely, PHWs most frequently listed financial incentives, paid time off, flexible scheduling, and organizational change. **Conclusion:** Organizations can best help their employees by organizing the workforce in a way that allows PHWs to take time off, creating a positive and supportive organizational climate, regularly assessing the needs of PHWs, clearly communicating the availability of employer-offered benefits, and emphasizing the acceptability of using those benefits.

**Moore et al. 2023.**

**Public Health Reports, vol. 138, no. 4.**

**User License:** *PMC Open Access Subset*

**Keywords:** COVID-19; mental health; public health departments; public health workforce.

**Evidence Level:** 4B

**Link:** <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10102824/>

## **Organisational Issues**

### **How effective are organizational-level interventions in improving the psychosocial work environment, health, and retention of workers? A systematic overview of systematic reviews.**

**Background** This study aimed to systematically review the effectiveness of organizational-level interventions in improving the psychosocial work environment and workers' health and retention.

**Methods:** We conducted an overview of systematic reviews on organizational-level interventions published between 2000 and 2020. We systematically searched academic databases, screened reference lists, and contacted experts, yielding 27 736 records. Of the 76 eligible reviews, 24 of weak quality were excluded, yielding 52 reviews of moderate (N=32) or strong (N=20) quality, covering 957 primary studies. We

assessed quality of evidence based on quality of review, consistency of results, and proportion of controlled studies. **Results:** Of the 52 reviews, 30 studied a specific intervention approach and 22 specific outcomes. Regarding intervention approaches, we found strong quality of evidence for interventions focusing on "changes in working time arrangements" and moderate quality of evidence for "influence on work tasks or work organization", "health care approach changes", and "improvements of the psychosocial work environment". Regarding outcomes, we found strong quality of evidence for interventions about "burnout" and moderate quality evidence for "various health and wellbeing outcomes". For all other types of interventions, quality of evidence was either low or inconclusive, including interventions on retention. **Conclusions:** This overview of reviews identified strong or moderate quality of evidence for the effectiveness of organizational-level interventions for four specific intervention approaches and two health outcomes. This suggests that the work environment and the health of employees can be improved by certain organizational-level interventions. We need more research, especially about implementation and context, to improve the evidence.

**Aust et al. 2023.**

**Scandinavian Journal of Work, Environment and Health, vol. 49, no. 5.**

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**Keywords:** Psychosocial work; health; retention; intervention.

**Evidence Level:** 1A

**Link:** <https://www.sjweh.fi/article/4097>

## Job Design

### **Longitudinal association of working from home on work functioning impairment in desk workers during COVID-19 pandemic: A nationwide cohort study.**

**Background:** This study clarifies the longitudinal association between working from home and work functioning impairment among desk workers. **Methods:** Nationwide surveys were conducted from 2020 to 2022, analyzing 3532 desk workers who never worked from home before the COVID-19 pandemic.

**Results:** The adjusted hazard ratio (95% confidence intervals) of working from home at least once a month or more with the composite result (incidence of work functioning or reduced work participation) was 1.22 (1.04-1.43). The cause-specific hazard ratios of work functioning impairment and reduced work participation were 1.30 (1.04-1.61) and 1.13 (0.86-1.47). **Conclusions:** Working from home could be longitudinally associated with work functioning impairment, especially for workers who are in higher positions. Workers and policy makers should be aware of the potential risk of working from home regarding presenteeism.

**Takayama et al. 2023.**

**Journal of Occupational and Environmental Medicine, vol. 65, no. 7.**

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**Keywords:** Working from home; work functioning impairment; desk workers.

**Evidence Level:** 4B

**Link:**

[https://journals.lww.com/joem/Fulltext/2023/07000/Longitudinal\\_Association\\_of\\_Working\\_From\\_Home\\_on.4.aspx](https://journals.lww.com/joem/Fulltext/2023/07000/Longitudinal_Association_of_Working_From_Home_on.4.aspx)

## Shift Work

*This month we explore the relationship between shift work and human gut microbiota, and non-alcoholic fatty liver disease.*

**Effects of unconventional work and shift work on the human gut microbiota and the potential of probiotics to restore dysbiosis.**

**Background:** The work environment is a factor that can significantly influence the composition and functionality of the gut microbiota of workers, in many cases leading to gut dysbiosis that will result in serious health problems. **Methods:** The aim of this paper was to provide a compilation of the different studies that have examined the influence of jobs with unconventional work schedules and environments on the gut microbiota of workers performing such work. As a possible solution, probiotic supplements, via modulation of the gut microbiota, can moderate the effects of sleep disturbance on the immune system, as well as restore the dysbiosis produced. **Results:** Rotating shift work has been found to be associated with an increase in the risk of various metabolic diseases, such as obesity, metabolic syndrome, and type 2 diabetes. Sleep disturbance or lack of sleep due to night work is also associated with metabolic diseases. In addition, sleep disturbance induces a stress response, both physiologically and psychologically, and disrupts the healthy functioning of the gut microbiota, thus triggering an inflammatory state. **Conclusions:** Other workers, including military, healthcare, or metallurgy workers, as well as livestock farmers or long-travel seamen, work in environments and schedules that can significantly affect their gut microbiota.

**Lopez-Santamarina et al. 2023.**

**Nutrients, vol. 15, no. 13.**

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**Keywords:** Farmers; gut microbiota; healthcare; military; probiotics; seafarers; workers.

**Evidence Level:** 6B

**Link:** <https://www.mdpi.com/2072-6643/15/13/3070>

### **Association between night shift work and NAFLD: A prospective analysis of 281,280 UK Biobank participants.**

**Background:** This study aimed to investigate the association between night shift work and the risk of nonalcoholic fatty liver disease (NAFLD). **Methods:** We conducted a prospective analysis of 281,280 UK Biobank participants. Cox proportional hazards models were used to estimate the association of night shift work with incident NAFLD. Polygenic risk score analyses were performed to assess whether a genetic predisposition to NAFLD modified the association. **Results:** During a median follow-up of 12.1 years (3,373,964 person-years), 2,555 incident NAFLD cases were identified. Compared with workers who never/rarely worked night shifts, those who worked some night shifts or usual/permanent night shifts were 1.12 (95% CI: 0.96-1.31) and 1.27 (95% CI: 1.08-1.48) times more likely to develop NAFLD, respectively. Among the 75,059 participants who had reports on lifetime experience of night shift work, those with a longer duration, a higher frequency, more consecutive night shifts and a longer length per shift all showed higher risks of incident NAFLD. Further analyses showed that the association between night shift work and incident NAFLD was not modified by a genetic predisposition to NAFLD. **Conclusions:** Night shift work was associated with increased risks of incident NAFLD.

**Huang et al. 2023.**

**BMC Public Health, vol. 23, no. 1.**

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**Keywords:** Genetic risk; night shift; nonalcoholic fatty liver disease.

**Evidence Level:** 4B

**Link:** <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-16204-7>

## **Management and Leadership**

### **A longitudinal perspective on the interplay of job demands and destructive leadership on employees' work ability in Germany.**

**Background:** Work ability as a predictor of early retirement or lengthy/frequent sick leaves becomes more and more relevant due to the demographic change. Therefore, factors, which affect employees' work ability, need to be further examined with a theoretical base. According to Karasek's job demands-control (JDC) model, high job demands and low control are related to poor employee health. The subsequent job demands-control support (JDCS) model proposed that a lack of support, also from leaders, has a negative impact on health indicators. This article looked at whether destructive leadership reinforces the negative

influence of high job demands on employees' work ability. **Methods:** We used the BAuA Working Time Survey waves 2015, 2017, and 2019 (BAuA-WTS), which are representative of employees in Germany. Our data set covers 2448 respondents, who took part in all three waves. Central to the analyses were the variables job demands, control, destructive leadership, and work ability. **Results:** Results from pooled ordinary least squares (OLS) and fixed effect (FE) models revealed that job demands influenced work ability negatively, whereas neither control by the employee nor the interaction of job demands and control was significant regarding effecting work ability in the FE models. Destructive leadership exerted a negative effect on work ability and moderated job demands significantly in the FE models meaning a further decrease in work ability. **Conclusion:** Leadership behavior should be further examined as an important factor for work ability.

**Kunz et al. 2023.**

**International Archives of Occupational and Environmental Health, vol. 96, no. 5.**

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**Keywords:** Destructive leadership; job demands–control (JDC) model; work ability.

**Evidence Level:** 4B

**Link:** <https://link.springer.com/article/10.1007/s00420-023-01962-z>

## Work Ability

*This month we explore the relationship between work ability and secondary traumatic stress; and post-Covid syndrome.*

### **Quality of life and ability to work of patients with Post-COVID syndrome in relation to the number of existing symptoms and the duration since infection up to 12 months: A cross-sectional study.**

**Background:** Following SARS-CoV-2 virus infection, patients may suffer from long-lasting symptoms regardless of disease severity. Preliminary results show limitations in health-related quality of life (HRQoL). The aim of this study is to show a possible change depending on the duration since infection and the accumulation of symptoms. Additionally, other possible influencing factors will be analyzed. **Methods:** The study population consisted of patients (18-65 years) presenting to the Post-COVID outpatient clinic of the University Hospital Jena, Germany, between March and October 2021. The HRQoL was assessed by the use of the RehabNeQ and the SF-36. Data analysis was descriptive with frequencies, means, and/or percentages. In addition, a univariate analysis of variance was performed to show the dependence of physical and psychological HRQoL on specific factors. This was finally tested for significance at an alpha level of 5%. **Results:** Data from 318 patients were analyzed, most of whom had 3-6 months of infection (56%) and 5-10 symptoms persisted (60.4%). Both mental (MCS) and physical sum score (PCS) of HRQoL were significantly lower than those of the German normal population ( $p < .001$ ). The number of remaining symptoms (MCS  $p = .0034$ , PCS  $p = .000$ ) as well as the perceived ability to work (MCS  $p = .007$ , PCS  $p = .000$ ) influenced the HRQoL. **Conclusion:** The HRQoL of patients with Post-COVID-syndrome is still reduced months after infection and so is their occupational performance. In particular, the number of symptoms could have an influence on this deficit, which would need to be further investigated. Further research is needed to detect other factors influencing HRQoL and to implement appropriate therapeutic interventions.

**Lemhöfer et al. 2023.**

**Quality of Life Research, vol. 32, no. 7.**

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**Keywords:** COVID-19; health-related quality of life; long-term complication; work ability.

**Evidence Level:** 4B

**Link:** <https://link.springer.com/article/10.1007/s11136-023-03369-2>

### **Secondary traumatic stress and work ability in death care workers: The moderating role of vicarious posttraumatic growth.**

**Background:** Death care work consists of dealing with traumatic events frequently, if not daily. This type of exposure is considered characteristic of the profession and can lead to significant negative consequences



such as secondary traumatic stress. However, sometimes positive changes can occur as a result of experiencing trauma, which is referred to as vicarious posttraumatic growth. **Methods:** The aim of the present study is to investigate the role of vicarious posttraumatic growth (VPTG) in the relationship between secondary traumatic stress (STS) and work ability (WA) in a sample of 231 death care workers in northern Italy. Regression analysis with interaction was performed using PROCESS. **Results:** The results showed a negative association between STS and WA and a positive association between VPTG and WA. The interaction between STS and VPTG was also statistically significant. The moderating role of VPTG was partially confirmed by the analysis: at low and moderate VPTG levels, the conditional effect was negative and statistically significant, while at high VPTG, STS exposure had no significant and negative effect on WA, as if VPTG had some kind of protective role against STS. **Conclusions:** These results provide new insights into the role of VPTG in work environments with daily trauma exposure, such as death care.

**Grandi et al. 2023.**

**PLoS One, vol. 18, no. 7.**

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**Keywords:** Traumatic stress; death; death care; work ability.

**Evidence Level:** 5B

**Link:** <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0289180>

## Adapting to the Future of Work

### Aging Workforce

**Do supportive work environments matter for minority aging? Work stress and subjective cognitive impairment among middle-age and older lesbian, gay, bisexual, transgender, and queer adults.**

**Background:** Research has documented how people's experiences at work affect their cognitive health outcomes, but how these processes unfold for minority groups, particularly lesbian, gay, bisexual, transgender, and queer (LGBTQ+) populations, is unclear. **Methods:** This study builds on the nascent literature by employing generalized structural equation models to test how experiencing major problems at work and working with LGBTQ+ supportive coworkers affect subjective cognitive impairment among middle-age and older LGBTQ+ adults. We also test for mediated and indirect effects of support and problems at work operating via vascular disease, sleep problems, and depression symptoms. **Results:** Experiencing major problems at work is associated with a higher likelihood of reporting cognitive symptoms consistent with mild cognitive impairment, but this relationship is mediated by depression symptoms and sleep problems. Having LGBTQ+ supportive coworkers does not have direct effects on mild cognitive impairment, but does operate indirectly by decreasing problems at work and, in turn, decreases the likelihood of reporting cognitive symptoms consistent with mild cognitive impairment. Overall, we find that workplace stressors contribute to cognitive health directly and through mediated and indirect pathways and that supportive contexts reduce exposure to problems at work. **Conclusions:** We conclude with suggested possibilities to reorganize workplaces to improve long-term cognitive health outcomes for older adults, especially those who are LGBTQ+-identified.

**Barbee et al. 2023.**

**Acta Psychologica, vol. 237.**

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**Keywords:** Cognitive health; LGBTQ+; midlife; supportive coworkers; work stress.

**Evidence Level:** 6B

**Link:** [https://linkinghub.elsevier.com/retrieve/pii/S0001-6918\(23\)00125-7](https://linkinghub.elsevier.com/retrieve/pii/S0001-6918(23)00125-7)

## Technology

*This month we explore the effect of app-based programs for sleep health, general and cognitive stress, and the relationship between an unguided, digital single-session intervention for internalising symptoms in web-based workers.*

### **Efficacy of an unguided, digital single-session intervention for internalizing symptoms in web-based workers: Randomized controlled trial.**

**Background:** The Common Elements Toolbox (COMET) is an unguided digital single-session intervention (SSI) based on principles of cognitive behavioral therapy and positive psychology. Although unguided digital SSIs have shown promise in the treatment of youth psychopathology, the data are more mixed regarding their efficacy in adults. **Objective:** This study aimed to investigate the efficacy of COMET-SSI versus a waiting list control in depression and other transdiagnostic mental health outcomes for Prolific participants with a history of psychopathology. **Methods:** We conducted an investigator-blinded, preregistered randomized controlled trial comparing COMET-SSI (n=409) with an 8-week waiting list control (n=419). Participants were recruited from the web-based workspace Prolific and assessed for depression, anxiety, work and social functioning, psychological well-being, and emotion regulation at baseline and at 2, 4, and 8 weeks after the intervention. The main outcomes were short-term (2 weeks) and long-term (8 weeks) changes in depression and anxiety. The secondary outcomes were the 8-week changes in work and social functioning, well-being, and emotion regulation. Analyses were conducted according to the intent-to-treat principle with imputation, without imputation, and using a per-protocol sample. In addition, we conducted sensitivity analyses to identify inattentive responders. **Results:** The sample comprised 61.9% (513/828) of women, with a mean age of 35.75 (SD 11.93) years. Most participants (732/828, 88.3%) met the criteria for screening for depression or anxiety using at least one validated screening scale. A review of the text data suggested that adherence to the COMET-SSI was near perfect, there were very few inattentive respondents, and satisfaction with the intervention was high. However, despite being powered to detect small effects, there were negligible differences between the conditions in the various outcomes at the various time points, even when focusing on subsets of individuals with more severe symptoms. **Conclusions:** Our results do not support the use of the COMET-SSI in adult Prolific participants. Future work should explore alternate ways of intervening with paid web-based participants, including matching individuals to SSIs they may be most responsive to. **Trial registration:** ClinicalTrials.gov [NCT05379881](https://clinicaltrials.gov/ct2/show/NCT05379881), <https://clinicaltrials.gov/ct2/show/NCT05379881>.

**Lorenzo-Luaces et al. 2023.**

**Journal of Medical Internet Research, vol. 25.**

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**Keywords:** Depression; emotion regulation; iCBT; internet-based cognitive behavioral therapy; transdiagnostic processes.

**Evidence Level:** 2B

**Link:** <https://www.jmir.org/2023/1/e45411>

### **Feasibility and preliminary efficacy of app-based audio tools to improve sleep health in working adults experiencing poor sleep: A multi-arm randomized pilot trial.**

**Background:** Many adults without a diagnosed sleep disorder report poor sleep. Recently, there has been a dramatic increase in the use of app-based audio tools to aid sleep by the general public, yet there is a paucity of evidence on whether such tools are efficacious. This study evaluated the feasibility and preliminary efficacy of two categories of audio tools, comprising music and narrated stories, featured on the Unmind app. **Methods:** We conducted an online, parallel, multi-arm, external pilot randomized controlled trial, with two intervention arms and a waitlist (WL) control group. Participants were working adults who were screened for poor sleep. Feasibility was assessed via objective and self-report measures. Preliminary efficacy was evaluated via self-report measures of sleep disturbance, work productivity, and other mental health outcomes, captured at baseline (t0) and following a 4-week intervention period (t1), and analyzed using mixed effects models with intention-to-treat principles. **Results:** Three hundred

participants were randomized, and 92% were retained at t1. 90.5% of participants completed at least one intervention session. 82.1% reported being "satisfied" or "very satisfied" with their intervention, and 84.3% rated their intervention as "good" or "excellent." The between-group Hedges' g effect size for sleep disturbance was 0.92 [0.63-1.22] and 1.09 [0.80-1.39] for the two interventions compared to the WL group.

**Conclusions:** Both interventions are feasible and acceptable. Preliminary efficacy findings suggest that audio tools designed to aid sleep could have widespread financial and public health implications, and should be investigated in a definitive trial. **Clinical trial:** International Standard Randomized Controlled Trial Number (ISRCTN), 12614821, <http://www.isrctn.com/ISRCTN12614821>.

**Economides et al. 2023.**

**Sleep, vol. 46, no. 7.**

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**Keywords:** Digital intervention; efficacy; feasibility; mental health; randomized controlled trial; sleep disturbance; smartphone app; work productivity.

**Evidence Level:** 2B

**Link:** <https://academic.oup.com/sleep/article/46/7/zsad053/7078038?login=true>

### **The mediating role of general and cognitive stress on the effect of an app-based intervention on productivity measures in workers: Randomized controlled trial.**

**Background:** Loss of productivity is a result of absence from work (absenteeism) or of working with limitations due to illness (presenteeism). Recently, occupational mental health interventions have increasingly been delivered in digital format, as this is thought to be more convenient, flexible, easily accessible, and anonymous. However, the effectiveness of electronic mental health (e-mental health) interventions in the workplace to improve presenteeism and absenteeism remains unknown, and could be potentially mediated by psychological variables such as stress levels. **Objective:** The aim of this study was to determine the effectiveness of an e-mental health intervention to reduce absenteeism and presenteeism in employees, as well as to investigate the mediating role of stress in this effect.

**Methods:** Employees of six companies in two countries participated in a randomized controlled trial (n=210 in the intervention group and n=322 in the waitlist control group). Participants in the intervention group could use the Kelaa Mental Resilience app for 4 weeks. All participants were asked to complete assessments at baseline, during the intervention, postintervention, and at a 2-week follow-up. Absenteeism and presenteeism were assessed by means of the Work Productivity and Activity Impairment Questionnaire: General Health, while general and cognitive stress were assessed through the Copenhagen Psychosocial Questionnaire-Revised Version. Regression and mediation analyses were performed to evaluate the effect of the Kelaa Mental Resilience app on presenteeism and absenteeism.

**Results:** The intervention did not have a direct effect on presenteeism or absenteeism, neither at postintervention nor at follow-up. Nevertheless, general stress significantly mediated the intervention effect on presenteeism (P=.005) but not on absenteeism (P=.92), and cognitive stress mediated the effect of the intervention on both presenteeism (P<.001) and absenteeism (P=.02) right after the intervention. At the 2-week follow-up, the mediating effect of cognitive stress on presenteeism was significant (P=.04), although this was not the case for its mediating effect on absenteeism (P=.36). Additionally, at the 2-week follow-up, general stress did not mediate the intervention effect on presenteeism (P=.25) or on absenteeism (P=.72). **Conclusions:** While no direct effect of the e-mental health intervention on productivity was found in this study, our findings suggest that stress reduction could mediate the effect of the intervention on presenteeism and absenteeism. As such, e-mental health interventions that address stress in employees might also indirectly reduce presenteeism and absenteeism in these employees. However, due to study limitations such as an overrepresentation of female participants in the sample and a high proportion of attrition, these results should be interpreted with caution. Future research is needed to better understand the mechanisms of interventions on productivity in the workplace.

**de Miquel et al. 2023.**

**JMIR, vol. 25.**

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**Keywords:** Absenteeism; e-mental health intervention; mediation; presenteeism; stress; work.

**Evidence Level:** 2B

**Link:** <https://www.jmir.org/2023/1/e42317>

## **Work Environment**

**Weathering the storm alone or together: Examining the impact of COVID-19 on sole and partnered working mothers.**

**Background and methods:** This study explores the effect of the pandemic on the mental health and job-related well-being of both sole and partnered working mothers (n=206). Participants were 206 mothers who continued to work during the pandemic. **Results and Conclusions:** The study found that when mothers were sole parents, the relationship between work--family conflict (WFC) and parenting stress was exacerbated and mediated the relationship between WFC and both poor mental health and decreased work engagement.

**Dionisi et al. 2023.**

**Journal of Community Psychology, vol. 51, no. 6.**

**Keywords:** Maternal behavior; parenting; single parent; work engagement; work-related stress.

**Evidence Level:** 5B

**Link:** <https://onlinelibrary.wiley.com/doi/10.1002/jcop.22829>