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# Workplace Research Monthly

Formerly Emerging Evidence Alert

August 2024

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 2024 only.

## Contents

## 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 |


## Enabling Healthy and Safe Workplaces

### Health and Wellbeing

*This month we explore health and wellbeing issues associated with ischemic heart disease and stroke in male couriers, anthropometric indices and metabolic syndrome, indoor biophilic greening and psychological and physiological responses, and gut metagenomes in dairy workers. We also explore issues with remote working and post-pandemic work-from-home conditions*

**Ischemic heart disease and stroke in male couriers: A cohort study using the national health insurance data and national employment insurance data**

**Background:** This study aimed to determine the risk of ischemic heart disease (IHD) and stroke among male couriers in Korea by linking the data from the National Health Insurance (NHI) and National Employee Insurance (NEI) databases. **Methods:** As of 2015, the NHI and NEI databases were linked using individual IDs. A cohort of male couriers, aged between 20 and 64 years, (*N* = 5,012) was constructed using the Korean Employment Insurance Occupational Classification (KECO-2007). For comparison, a cohort of male total wage workers (*N* = 5,429,176) and a cohort of office workers (*N* = 632,848) within the same age group were also constructed. The follow-up was conducted until 31 December 2020 to confirm the occurrence of IHD and stroke. The diagnoses were defined using the 10th revision of the International Statistical Classification of Diseases and Related Health Problems (ICD-10) codes. The criteria included medical services for more than 1 day of hospitalization or more than 2 outpatient visits. The age-standardized incidence ratio (SIR) was calculated to evaluate the risk of occurrence. The hazard ratio (HR) was calculated using the Cox model after adjusting for age, alcohol consumption, smoking, obesity, income level, and employment duration as confounding variables. **Results:** The SIR of IHD for couriers was 1.54 (95% CI 1.31-1.78), while for office workers, it was 1.08 (95% CI 1.06-1.10), compared to male total wage workers. The SIR for stroke was higher for couriers at 1.84 (95% CI 1.40-2.28) and lower for office workers at 0.86, compared to male total wage workers. Couriers had a higher SIR for stroke at 1.84 (95% CI 1.40-2.28) and lower for office workers at 0.86 (0.83-0.89). Compared to total wage workers, couriers had a significantly higher adjusted HR for IHD at 1.60 (95% CI 1.37-1.87) and a higher HR for stroke at 1.39 (95% CI 1.07-1.79). Compared to office workers, couriers had a significantly higher HR for IHD at 1.34 (95% CI 1.13-1.59) as well as for for stroke at 1.43 (95% CI 1.08-1.88). **Conclusion:** The incidence of IHD and stroke was higher among male couriers compared to male office workers and total wage workers, highlighting the need for implementing public health interventions to prevent IHD and stroke among couriers.

**Yoon et al. 2024.**

**Frontiers in Public Health, vol. 12.**

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**Keywords:** Ischemic heart disease; stroke; male couriers.

**Evidence Level:** 4B

**Link:** https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1416327/full

**The predictive capability of several anthropometric indices for identifying the risk of metabolic syndrome and its components among industrial workers**

**Background:** Metabolic syndrome (MetS) is closely associated with adverse cardiometabolic outcomes. The objective of this study was to identify practical methods that could enable the effective identification of MetS based on anthropometric indices. **Method:** The basis of our study involved retrospective database obtained from routine medical prophylactic examinations. This was a cross-sectional study on the health status of male workers employed in hazardous working conditions at industrial enterprises in the Ural region conducted in 2019. A total of 347 male workers employed under hazardous working conditions were investigated. The presence of MetS was established by a healthcare professional in accordance with the guidelines of the International Diabetes Federation (IDF). Simple linear regression was used to evaluate the associations between anthropometric indices and MetS incidence. Logistic regression was used to determine the odds ratios of MetS in relation to increases in anthropometric indices. ROC curves were calculated to compare the ability of each anthropometric index to predict MetS and to determine the diagnostic thresholds of the indicators considered. **Results:** According to the IDF criteria, 36.3% of the

workers had MetS. A direct relationship was found between the individual components of MetS and the anthropometric indices studied. The highest OR was shown by the Body Roundness Index (BRI) of 2.235 (95% CI 1.796-2.781). For different age quartiles, the optimal cut-off values for predicting MetS were as follows: BRI, 4.1-4.4 r.u.; body shape index (ABSI), 0.080-0.083 $m^{11/6}$ $kg^{-2/3}$; and lipid accumulation product (LAP), 49.7-70.5 cm mmol/l. The most significant associations with MetS were observed where the values were greater than these cut-off points (Se = 97.4%). **Conclusion:** The results of this study demonstrated the rapid use of new anthropometric indicators, which have shown good predictive ability and are quite easy to use.

**Konstantinova et al. 2024.**
**Scientific Reports, vol. 14, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Anthropometric index; logistic regression; metabolic syndrome; ROC analyses.
**Evidence Level:** 4B
**Link:** https://www.nature.com/articles/s41598-024-66262-z

**Remote working and experiential wellbeing: A latent lifestyle perspective using UK time use survey before and during COVID-19**

**Background:** Mental health in the UK had deteriorated compared with pre-pandemic trends. Existing studies on heterogenous wellbeing changes associated COVID-19 tend to segment population based on isolated socio-economic and demographic indicators, notably gender, income and ethnicity, while a more holistic and contextual understanding of such heterogeneity among the workforce seems lacking. **Method:** This study addresses this gap by 1) combining UK time use surveys collected before and during COVID-19, 2) identifying latent lifestyles within three working mode groups (commuter, homeworker and hybrid worker) using latent class model, and 3) quantifying nuanced experiential wellbeing (ExWB) changes across workers of distinct lifestyles. **Results:** The direction and magnitude of ExWB changes were not uniform across activity types, time of day, and lifestyles. The direction of ExWB change during the daytime activities window varied in accordance with lifestyle classifications. Specifically, ExWB decreased for all homeworkers but increased significantly for certain hybrid workers. Magnitude of ExWB change correlated strongly with lifestyle. To understand the significant heterogeneity in ExWB outcomes, a spatial-temporal conceptualisation of working flexibility is developed to explicate the strong yet complex correlations between wellbeing and lifestyles. **Conclusion:** The implications to post-pandemic "back-to-work" policies are 1) continued expansion of hybrid working optionality, 2) provide wider support for lifestyle adaptation and transitions.

**Chen et al. 2024.**
**PLoS One, vol. 19, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Remote working; mental health; wellbeing; lifestyle; COVID-19.
**Evidence Level:** 4B
**Link:** https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0305096

**Practical considerations of workplace wellbeing management under post-pandemic work-from-home conditions**

**Background:** As a natural experiment or "stress test" on the rapidly shifting work environment from office to home during and after the COVID-19 pandemic, staff wellbeing has been considered as the most critical issue in organizational change management. **Method:** Following an overview of the relevant literature and recent official statistics, this essay aims to (i) address the major considerations and challenges in light of the transformation and re-design of the mode of work in the new normal and (ii) inform practical decisions for overall staff wellbeing under post-pandemic work-from-home (WFH) conditions with recommendations. **Results:** For the sake of both staff healthiness and safety, as well as organizational competitiveness, senior management should take reasonable steps to enhance occupational safety in their WFH policy in line with practical recommendations on five areas, namely, (i) ergonomics, (ii) stress and anxiety management, (iii) workplace boundaries, (iv) work-family conflicts, and (v) other factors regarding a negative work atmosphere (e.g., loneliness attack, burnout, and workplace violence) particularly on virtual platforms.

**Conclusion:** With the suggested evidence-based practices on WFH initiatives, senior management could make a difference in optimizing the overall workplace wellbeing of staff after the pandemic.
**Cheung 2024.**
**International Journal of Environmental Research and Public Health, vol. 21, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** COVID-19; occupational health; organizational innovation; personnel management; teleworking.
**Evidence Level:** 6B
**Link:** https://www.mdpi.com/1660-4601/21/7/924

**The effects of different designs of indoor biophilic greening on psychological and physiological responses and cognitive performance of office workers**
**Background:** Impression on biophilic designs influences the effects of indoor greening. The current study aimed to investigate the effects of different biophilic designs in office rooms on the psychological and physiological responses and the cognitive performance of office workers**. Method:** Indoor greening rooms with Japanese and tropical designs were used along with the green-free (control) design in this study. **Results:** The heart rate variability of the participants was not affected by green designs. However, there was improvement in impressions on tropical and Japanese designs in office rooms. In particular, the Japanese design was more effective in decreasing negative emotions than the tropical design. The electroencephalography during 5-min exposure to the greening designs showed limited frequency bands and regions of interest affected by the greenery design. Taken together with the psychological data, indoor greening with the tropical design promoted positive mood states. Meanwhile, indoor greening in the Japanese design, inhibited negative mood states. However, there were no significant differences between the two designs in terms of cognitive task performance. **Conclusion:** Hence, indoor greening increases neural efficiency during cognitive tasks.
**Fukumoto et al. 2024.**
**PLoS One, vol. 19, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Indoor biophilic greening; psychological; physiological; office workers.
**Evidence Level:** 5B
**Link:** https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0307934

**A cross-sectional comparison of gut metagenomes between dairy workers and community controls**
**Background:** As a nexus of routine antibiotic use and zoonotic pathogen presence, the livestock farming environment is a potential hotspot for the emergence of zoonotic diseases and antibiotic resistant bacteria. Livestock can further facilitate disease transmission by serving as intermediary hosts for pathogens before a spillover event. **Method** In light of this, we aimed to characterize the microbiomes and resistomes of dairy workers, whose exposure to the livestock farming environment places them at risk for facilitating community transmission of antibiotic resistant genes and emerging zoonotic diseases. **Results:** Using shotgun sequencing, we investigated differences in the taxonomy, diversity and gene presence of 10 dairy farm workers and 6 community controls' gut metagenomes, contextualizing these samples with additional publicly available gut metagenomes. We found no significant differences in the prevalence of resistance genes, virulence factors, or taxonomic composition between the two groups. The lack of statistical significance may be attributed, in part, to the limited sample size of our study or the potential similarities in exposures between the dairy workers and community controls. We did, however, observe patterns warranting further investigation including greater abundance of tetracycline resistance genes and prevalence of cephamycin resistance genes as well as lower average gene diversity (even after accounting for differential sequencing depth) in dairy workers' metagenomes. We also found evidence of commensal organism association with tetracycline resistance genes in both groups (including Faecalibacterium prausnitzii, Ligilactobacillus animalis, and Simiaoa sunii). **Conclusions:** This study highlights the utility of shotgun metagenomics in examining the microbiomes and resistomes of livestock workers, focusing on a cohort of dairy workers in the United States. While our study revealed no statistically significant differences between groups in taxonomy, diversity and gene presence, we observed patterns in antibiotic resistance gene abundance and prevalence that align with findings from previous studies of livestock workers in China

and Europe. Our results lay the groundwork for future research involving larger cohorts of dairy and non-dairy workers to better understand the impact of occupational exposure to livestock farming on the microbiomes and resistomes of workers.
**Trinh et al. 2024.**
**BMC Genomics, vol. 25, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)v*
**Keywords:** Antibiotic resistance; livestock farming; microbiome; shotgun metagenomics; virulence factors.
**Evidence Level:** 4B
**Link:** https://bmcgenomics.biomedcentral.com/articles/10.1186/s12864-024-10562-1

## Work Health and Safety

*This month we explore work health and safety issues associated with worker sleep deprivation and sun-related knowledge and practices in the construction industry, personal protective equipment and safety culture, working at high altitude and cardiovascular disease, and occupational tuberculosis infection among high-risk workers. We also explore conditions of safe use by workers in chemical manufacturing companies and the challenges and approaches in the workplace during the Covid-19 pandemic*

**Enhancing construction safety: Predicting worker sleep deprivation using machine learning algorithms**
**Background:** Sleep deprivation is a critical issue that affects workers in numerous industries, including construction. It adversely affects workers and can lead to significant concerns regarding their health, safety, and overall job performance. Several studies have investigated the effects of sleep deprivation on safety and productivity. Although the impact of sleep deprivation on safety and productivity through cognitive impairment has been investigated, research on the association of sleep deprivation and contributing factors that lead to workplace hazards and injuries remains limited. **Method** To fill this gap in the literature, this study utilized machine learning algorithms to predict hazardous situations. Furthermore, this study demonstrates the applicability of machine learning algorithms, including support vector machine and random forest, by predicting sleep deprivation in construction workers based on responses from 240 construction workers, identifying seven primary indices as predictive factors. **Results:** The findings indicate that the support vector machine algorithm produced superior sleep deprivation prediction outcomes during the validation process. The study findings offer significant benefits to stakeholders in the construction industry, particularly project and safety managers. **Conclusion:** By enabling the implementation of targeted interventions, these insights can help reduce accidents and improve workplace safety through the timely and accurate prediction of sleep deprivation.
**Sathvik et al. 2024.**
**Scientific Reports, vol. 14, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Construction safety; construction workers; machine learning; safety performance; sleep deprivation.
**Evidence Level:** 5B
**Link:** https://www.nature.com/articles/s41598-024-65568-2

**The role of European chemical manufacturing companies in promoting effective communication of conditions of safe use by workers**
**Background:** In 2006, the revised chemicals management legislation mandated that manufacturers of hazardous chemical substances conduct risk assessments for the entire substance life cycle. Additionally, they must communicate use-specific safe handling advice (exposure scenarios) to their customer, as annex to the Safety Data Sheet (SDS). Despite significant efforts to develop workable solutions for chemical mixtures, this goal has not yet been fully achieved. **Method:** Therefore, a Cefic research project (LRI B23) was commissioned on how to ensure meaningful health risk communication for workers across supply chains. **Results:** The research project determined that risk-based safe use advice generated by manufacturers, often does not reach the intended end-user and was seen as not tailored to specific user

needs. Recipients of the advice are also not prepared to act based on information developed by suppliers. From an industry perspective, the complexity of supply chains and substance life cycles are considered major barriers for effective safe use communication. Exposure scenarios for substance use in industrial work environments are often perceived as adding little value compared to existing safe use arrangements required by other health, safety, and environmental legislation applicable to employers and duty-holders. **Conclusion:** To attain meaningful use-specific safe handling advice for workers, including those at non-industrial premises who may benefit most from such advice, knowledge transfer and close collaboration between manufacturers and formulators remain key elements, supported by enhanced regulatory appreciation.
**Urbanus et al. 2024.**
**Annals of Work Exposures and Health, vol. 68, no. 6.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** REACH; Safe Use Communication; Safety Data Sheets; chemical safety; chemicals regulation.
**Evidence Level:** 5B
**Link:** https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11229308/

**Assessing personal protective equipment usage and its correlation with knowledge, attitudes, performance, and safety culture among workers in small and medium-sized enterprises**
**Background:** The use of personal protective equipment (PPE) should be a culture of a workplace, and deeply rooted in worker behavior and attitude during their practice. According to the recent studies only 64% of the workers use PPE properly. The present study aims to investigate the utilization of PPE among workers in small and medium-sized enterprises (SMEs), and its relationship with knowledge, attitude, performance, and safety culture among workers. **Methods:** This cross-sectional study was carried out using a questionnaire tool across SMEs in Kashan city in year 2023. The used tool included three questionnaires: demographic, safety culture, and knowledge, attitude and performance. Study papulation was 529 SMEs. Totally, the sample size was 369 persons and questionnaires were distributed among the workers of SMEs. Finally, SPSS software was used for statistical analysis and structural equation modeling. Various statistical tests including T-Test, ANOVA, RMSEA, CFI, TLI, and the chi-square ratio were employed. **Results:** The mean values (standard deviation) of age and work experience were 35.19 (12.33), and 15.60 (1.69) years, respectively. Among the 369 participants, 267 participants (72.4%) indicated that they use some PPE, although not all types. However, 102 individuals (27.7%) do not employ any PPE. The lowest score for safety culture dimension was attributed to safety training at 1.58. The results of the final model indicate that the assumed relationships between variables, as outlined in the study objectives, were well established, with all connections proving statistically significant. **Conclusion:** It can be concluded that the missing of inadequate legal supervision for small industries exists. Therefore, it can be inferred that if supervision and regulation are enhanced for safety training and implementation that may lead to increased usage of PPE.
**Khoshakhalgh et al. 2024.**
**BMC Public Health, vol. 24, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** PPE; SMEs; safety culture; safety knowledge; small and medium sized enterprises.
**Evidence Level:** 4B
**Link:** https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-19517-3

**Work at high altitude and non-fatal cardiovascular disease associated with unfitness to work: Prospective cohort observation**
**Background:** Mining at high altitude exposes workers to hypoxic environment and cold climate in addition to conventional hazards in mining, but very little is known on how to define fitness to work in prospective candidates with pre-existing conditions. The aim of the current study was to define the incidence of cardiovascular diseases leading to unfitness to work as well as their predictors in a prospective observation. **Methods:** A total of 569 prospective employees (median age 34 (interquartile range (IQR) 28;40) years, 95% men 85% mid-altitude residents) for a high-altitude gold mine in Kyrgyzstan operating at 3800-4500 meters above sea level were screened at pre-employment in 2009-2012 and followed by January 2022. Cox

regression was used to quantify the association of baseline demographics and physiological variables with newly diagnosed cardiovascular diseases (CVD) leading to unfitness to work, expressed as hazard ratios (HRs) with 95% confidence intervals (CI). **Results:** With 5190 person-years of observation, 155 (27%) workers have left work, of whom 23 had a newly identified CVD leading to unfitness to work (cumulative incidence 4%) with no difference between drivers and other occupations, despite greater blood pressure and body mass index (BMI) in the former at baseline. Age (HR 1.13 (95% CI 1.06;1.22) and BMI (HR 1.18 (95% CI 1.04;1.34)) were associated with a greater chance of having CVD, adjusted for lung function, baseline diagnoses, year of employment and baseline blood pressure. Narrowing the analysis to only men, drivers, smokers and even middle-altitude residents did not change the effect. **Conclusion:** These findings confirmed high efficacy of pre-employment screening limiting access of workers with advanced conditions to work which later yielded low CVD incidence. In addition to conventional contraindications to work at high altitude, age and high BMI should be considered when a decision is made.
**Vinnikov et al. 2024.**
**PLoS One, vol. 19, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** High altitude; non-fatal cardiovascular disease; unfitness to work.
**Evidence Level:** 4B
**Link:** https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0306046

**Burden and factors associated with occupational tuberculosis infection among high-risk workers in Lahore District, Pakistan**
**Background:** The main objective of the study was to estimate the burden of occupational tuberculosis infection in high-risk occupational workers and to identify risk factors associated with the prevalence of Mycobacterium tuberculosis complex (MTBC). **Methodology:** An analytical cross-sectional study was conducted among high-risk occupational workers including veterinarians, abattoir workers, animal handlers, livestock farmers, and microbiology laboratory workers. Sputum samples were collected from 100 participants and polymerase chain reaction (PCR) tests were done to diagnose tuberculosis (TB) infection. Data on potential risk factors was collected in a pre-designed questionnaire. The MTBC prevalence ratio was estimated. Logistic regression analysis was conducted to identify risk factors and the crude odds ratio (OR) was calculated. **Results:** Among the 100 enrolled high risk occupational workers, the prevalence of MTBC was 46% (95% CI: 35.98-56.25). Living in a joint family (OR 3.85, 95% CI: 1.58-9.37), and use of unpasteurized milk (OR 3.42, 95% CI: 1.4-8.39), were significantly associated with MTBC infection. **Conclusions:** Tuberculosis is a significant health burden in high-risk occupational groups, especially animal handlers and laboratory workers, in Lahore, Pakistan. The study also emphasized the need for formal work-related training, and enhanced zoonotic TB awareness among occupational workers.
**Jabeen et al. 2024.**
**The Journal of Infection in Developing Countries, vol. 18, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** MTBC; Pakistan; occupational workers; tuberculosis; zoonosis.
**Evidence Level:** 4B
**Link:** https://jidc.org/index.php/journal/article/view/39078787

**Learning from an experience, challenges and approaches in the workplace during COVID-19 pandemic: A content analysis of international documents**
**Background:** This study aims to investigate international measures for pandemic control in the workplace based on guidelines from international organizations to learn from their experiences.
**Methods:** We conducted a qualitative study using content analysis. The search method involved reviewing published guidelines on preventing and responding to the COVID-19 pandemic in workplaces. After the screening process, ten guidelines were included in the content analysis. During the analysis, 200 meaning codes, 49 subcategories, and eleven categories were identified. Trustworthiness criteria were utilized to ensure the accuracy and strength of the findings. **Results:** Eleven categories of international content during the COVID-19 pandemic were legal requirements and duties of employees and employers, structural and program changes, risk assessment, risk communication, information and training, internal and external

consultation and cooperation, provision of facilities and tools for workplace hygiene, special conditions, special groups, closing and reopening workplaces, reducing contact and exposure and mental health. **Conclusions:** Protecting employees during a pandemic requires a multifaceted approach and strong advocacy. The operational plan for pandemic control should be developed based on the level of risk, with support tailored to employees' conditions and needs. Cooperation among international organizations is essential to develop a standardized plan and issue comprehensive guidelines in response to health emergencies with a global perspective and local implementation, drawing from the lessons learned during the COVID-19 pandemic.
**Ghayen et al. 2024.**
**BMC Public Health, vol. 24, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Approach; COVID-19; challenge; international guideline; lesson learned; literature review; workplace.
**Evidence Level:** 5A
**Link:** https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-19251-w

**Sun-related knowledge and practices in Irish construction and agricultural workers**
**Background:** Agricultural and construction workers spend much of their work time outdoors and have higher risks of developing skin cancer when compared to indoor workers. However, there is limited research on ultraviolet radiation (UVR) exposure knowledge, sun safety practices and constraints within these occupational groups in Ireland. **Aims:** This study aimed to examine self-reported time spent outdoors in a sample of Irish agricultural and construction workers; to describe and compare UVR exposure knowledge, safety practices and perceived constraints in both occupational groups, and to assess the association of demographic, personal and occupational factors with sun-related knowledge, practices and perceived constraints. **Methods:** Agricultural workers (n = 154) and construction workers (n = 467) completed a questionnaire, which measured solar UVR exposure knowledge, safety practices, and perceived constraints to sun personal protective equipment and sunscreen use in addition to demographic, personal, and workplace characteristics. Mann-Whitney and Kruskal-Wallis tests were used to examine differences in knowledge, practices and perceived constraints by these characteristics. **Results:** Both groups spend a significant proportion of their working week outdoors (25 hours per week on average). Although participation in sun safety training was high for both groups, UVR exposure knowledge and sunscreen use were low, and annual rates of reported sunburn were high. Knowledge, practices and perceived constraints also differed significantly according to demographic, personal, occupational and workplace characteristics. **Conclusions:** In addition to training by employers and advisory groups, interventions are required to address perceived barriers that impede the uptake and usage of control measures that can lower risk.
**Hogan et al. 2024.**
**Occupational Medicine, vol. 74, no. 5.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Sun exposure; Irish; construction workers; agricultural workers.
**Evidence Level:** 4B
**Link:** https://academic.oup.com/occmed/article/74/5/378/7712467?login=false

## Ergonomics

**Promoting safety of underground machinery operators through participatory ergonomics and fuzzy model analysis to foster sustainable mining practices**
**Background:** One of the most vital parameters to achieve sustainability in any field is encompassing the Occupational Health and Safety (OHS) of the workers. In mining industry where heavy earth moving machineries are largely employed, ergonomic hazards turn out to be significant OHS hazards causing Musculoskeletal Disorders (MSDs) in the operators. Nevertheless, the Indian mining industry lacks a comprehensive technique of OHS risk assessment, especially for ergonomic hazards that cause MSDs. **Method:** This research appraises ergonomic hazards and develops Fuzzy Musculoskeletal-disorders Index (FMI) model to evaluate ergonomic-related MSDs. Work process and work tool ergonomic risk factors were

identified through literature review and directives recommended by experts. Work posture was evaluated using RULA. The data-collecting approach was implemented using participatory ergonomic and design science principles. **Results:** The FMI results show average MSDs score of 3.69, indicating high to extremely high risk. Surface plots show that combined work tool and work process was the most sensitive factors to MSDs risk compared to other two combinations. A two-sample t-test validated the FMI. **Conclusion:** The findings should help safety experts and managers develop effective OHS management plans and programmes for the sustainability of Indian mining industry.
**Sakinala et al. 2024.**
**Scientific Reports, vol. 14, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Fuzzy logic model; muscular skeletal disorders; participatory ergonomics; sustainable mining; work posture assessment; work process assessment; work tool assessment.
**Evidence Level:** 5B
**Link:** https://www.nature.com/articles/s41598-024-67375-1

## Chronic Health Issues

*This month we explore chronic health issues associated with early inflammatory arthritis, prolonged SARS-CoV-2 symptoms, measuring chronic pain, and diabetes treatment status and occupational accidents.*

**Occupational impacts of early inflammatory arthritis: Results from the National Early Inflammatory Arthritis Audit**
**Background:** Inflammatory arthritis causes significant work disability. Studies regarding this frequently fail to report important contextual information such as employment type. Our objective was to explore work participation, by gender and occupation type, in early inflammatory arthritis. **Methods:** Data are from the National Early Inflammatory Arthritis Audit for 2018-2020. At diagnosis, clinicians collected information on demographics, inflammatory arthritis disease activity, and working status. Participants completed patient-reported outcomes at baseline, 3 months and 12 months, including occupation and Work Productivity and Activity Impairment (WPAI). Descriptive analyses of work participation and WPAI scores by occupational class at all time points were performed. Regression models were used to examine associations between WPAI score and occupation. **Results:** In all, 12 473 people received a diagnosis of inflammatory arthritis and reported employment status, among whom 5999 (47%) were in paid work for at least 20 hours/week. At diagnosis, the working cohort had statistically significant lower measures of disease activity ($P < 0.001$). Occupational data were available for 3694 individuals. At diagnosis, 2793 completed a WPAI; 200 (7.2%) had stopped work and 344 (12.3%) changed jobs because of inflammatory arthritis symptoms. There was a high burden of absenteeism (30%) and presenteeism (40%). Compared with managerial or professional workers, the burden of work disability was greater among those in routine (manual) occupations. During follow-up, 9.4% of WPAI completers stopped work and 14.6% changed roles. Work drop-out occurred almost entirely among people doing routine jobs. **Conclusion:** It is easier to retain work in certain employment sectors. Participation in routine jobs is more affected, which may widen health inequalities.
**Bechman et al. 2024.**
**Rheumatology, vol. 63, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Employment; inflammatory arthritis; patient-reported outcome measures.
**Evidence Level:** 4B
**Link**: https://academic.oup.com/rheumatology/article/63/7/1856/7277191?login=false

**The association between prolonged SARS-CoV-2 symptoms and work outcomes**
**Background:** While the early effects of the COVID-19 pandemic on the United States labor market are well-established, less is known about the long-term impact of SARS-CoV-2 infection and Long COVID on employment. **Method:** To address this gap, we analyzed self-reported data from a prospective, national cohort study to estimate the effects of SARS-CoV-2 symptoms at three months post-infection on missed workdays and return to work. **Results:** The analysis included 2,939 adults in the Innovative Support for

Patients with SARS-CoV-2 Infections Registry (INSPIRE) study who tested positive for their initial SARS-CoV-2 infection at the time of enrollment, were employed before the pandemic, and completed a baseline and three-month electronic survey. At three months post-infection, 40.8% of participants reported at least one SARS-CoV-2 symptom and 9.6% of participants reported five or more SARS-CoV-2 symptoms. When asked about missed work due to their SARS-CoV-2 infection at three months, 7.2% of participants reported missing ≥10 workdays and 13.9% of participants reported not returning to work since their infection. At three months, participants with ≥5 symptoms had a higher adjusted odds ratio of missing ≥10 workdays (2.96, 95% CI 1.81-4.83) and not returning to work (2.44, 95% CI 1.58-3.76) compared to those with no symptoms. Prolonged SARS-CoV-2 symptoms were common, affecting 4-in-10 participants at three-months post-infection, and were associated with increased odds of work loss, most pronounced among adults with ≥5 symptoms at three months. **Conclusion:** Despite the end of the federal Public Health Emergency for COVID-19 and efforts to "return to normal", policymakers must consider the clinical and economic implications of the COVID-19 pandemic on people's employment status and work absenteeism, particularly as data characterizing the numerous health and well-being impacts of Long COVID continue to emerge. Improved understanding of risk factors for lost work time may guide efforts to support people in returning to work.

**Venkatesh et al. 2024.**
**PLoS One, vol. 19, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** SARS-CoV-2; COVID-19; symptoms.
**Evidence Level:** 4B
**Link:** https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0300947

**Do current methods of measuring the impact of chronic pain on work reflect the experience of working-age adults? An integrated mixed-methods systematic narrative review**

**Background:** Chronic pain affects individuals' work participation. The impact of chronic pain on work has historically been measured through sickness absence, though it is now appreciated that the impacts on work are far wider. **Method:** This mixed-methods review aimed to identify the full range of impacts of pain on work in addition to impacts that are currently measured quantitatively to inform the development of a new questionnaire assessing the wider impacts of chronic pain on work. MEDLINE, Embase, PsychINFO, and CINAHL were searched for studies that included quantitative measures of the impact of chronic pain on work and for qualitative studies where individuals described impacts of their chronic pain on work. Quantitative measures, and text from qualitative studies, were analysed thematically. A thematic framework was developed for establishing the types of impacts measured or described in the literature. **Results:** Forty-four quantitative and 16 qualitative papers were identified. The literature described impacts within 5 areas: changes at work and to working status; aspects of the workplace and work relationships; pain and related symptoms at work; psychological factors; and factors and impacts outside the work environment related to work. Quantitative measures mainly assessed impacts related to the quantity and quality of work (29 of 42 measures). Seventeen aspects were only discussed within the qualitative literature. **Conclusion:** This study identifies a discrepancy between the impacts that have been the focus of quantitative measures and the range that individuals working with chronic pain experience and highlights the need for a new measure assessing a wider range of issues.

**Stagg et al. 2024.**
**Pain, vol. 165, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Chronic pain; working age; work.
**Evidence Level:** 1B
**Link:**
https://journals.lww.com/pain/fulltext/2024/07000/do_current_methods_of_measuring_the_impact_of.7.aspx

**Relationship between diabetes treatment status and occupational accidents**
**Background:** To evaluate the relationship between diabetes treatment status and occupational accidents. **Methods:** A cross-sectional study was conducted using an online questionnaire survey completed in March 2022 among workers aged 20 years or older. The questionnaire included questions about diabetes treatment status and occupational accidents. The association between the treatment status of diabetes and occupational accidents was examined using a logistic regression analysis. **Results:** The study included 25,756 participants with no diabetes, 1,364 participants receiving diabetes treatment, 177 participants who had interrupted diabetes treatment, and 396 participants who needed diabetes treatment but had not seen a doctor. Compared with those with diabetes treatment, the odds ratio of occupational accidents among participants without diabetes was 0.40 (95% CI: 0.32-0.49), the odds ratio among participants with interrupted diabetes treatment was 4.15 (95% CI: 2.86-6.01), and the odds ratio among participants who needed diabetes treatment but had not seen a doctor was 1.25 (95% CI: 0.89-1.77). **Conclusions:** This study showed that diabetes treatment status was related to occupational accidents, and it may be important for workers with diabetes to be supported to balance their diabetes management and their work commitments.
**Ogasawara et al. 2024.**
**Journal of Diabetes Investigation, vol. 15, no. 7.**
**User License:** *Creative Commons - Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) (https://creativecommons.org/licenses/by-nc/4.0/)*
**Keywords:** Cross sectional study; diabetes; occupational health.
**Evidence Level:** 4B
**Link:** https://onlinelibrary.wiley.com/doi/10.1111/jdi.14187

## Occupational Exposure

*This month we explore occupational exposure issues associated with heat illness, noncommunicable diseases, hepatobiliary malignant neoplasms and ionizing radiation, asbestos exposure and pleural plaques, asbestos and asbestosis, respirable crystalline silica and incident idiopathic interstitial pneumonias and pulmonary sarcoidosis and exposure to organic solvents and risk of developing testicular germ cell tumors. In other studies we explore the effects of occupational whole-body vibration, benzene and risk of lymphohaematopoietic cancers and pesticides and neurobehavioral outcomes.*

**Symptoms of heat illness and water consumption habits in mine industry workers over the summer months in Australia**
**Background and Method:** Mine industry workers (n=515) from various locations in Australia completed a questionnaire to assess the prevalence of symptoms associated with heat-related illness and water consumption habits during a summer season. Participants read from a pre-defined list and noted any heat-related symptoms that they had experienced. **Results:** The most prevalent symptoms experienced were fatigue, headache, sweating, and dark coloured urine, with 77% of respondents reporting at least one symptom. Workers with shorter employment durations had higher rates of reporting multiple symptoms (rates ratios: 1.40-1.72). The most prevalent water consumption amounts over an 11-12 h shift were 2-4 L by 37.3% of total respondents, followed by 1-2 L by 36.5% of respondents. **Conclusions:** Employers should inform workers about the severe implications of heat-related illnesses, implement regular water breaks, and educate personnel about the importance of water intake. Providing employees with self-check methods of hydration status is recommended to increase awareness of their hydration status.
**Taggart et al. 2024.**
**Industrial Health, vol. 62, no. 4.**
**User License:** *Creative Commons Attribution -NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) (https://creativecommons.org/licenses/by-nc-nd/4.0/)*
**Keywords**: Dehydration; heat-related illness; industrial accidents; mining; occupational heat strain; thermal stress.
**Evidence Level:** 4A
**Link:** https://www.jstage.jst.go.jp/article/indhealth/62/4/62_2023-0139/_article

**Narrative review of occupational exposures and noncommunicable diseases**

**Background:** Within the scope of the Exposome Project for Health and Occupational Research on applying the exposome concept to working life health, we aimed to provide a broad overview of the status of knowledge on occupational exposures and associated health effects across multiple noncommunicable diseases (NCDs) to help inform research priorities. **Methods:** We conducted a narrative review of occupational risk factors that can be considered to have "consistent evidence for an association," or where there is "limited/inadequate evidence for an association" for 6 NCD groups: nonmalignant respiratory diseases; neurodegenerative diseases; cardiovascular/metabolic diseases; mental disorders; musculoskeletal diseases; and cancer. The assessment was done in expert sessions, primarily based on systematic reviews, supplemented with narrative reviews, reports, and original studies. Subsequently, knowledge gaps were identified, e.g. based on missing information on exposure-response relationships, gender differences, critical time-windows, interactions, and inadequate study quality. **Results:** We identified over 200 occupational exposures with consistent or limited/inadequate evidence for associations with one or more of 60+ NCDs. Various exposures were identified as possible risk factors for multiple outcomes. Examples are diesel engine exhaust and cadmium, with consistent evidence for lung cancer, but limited/inadequate evidence for other cancer sites, respiratory, neurodegenerative, and cardiovascular diseases. Other examples are physically heavy work, shift work, and decision latitude/job control. For associations with limited/inadequate evidence, new studies are needed to confirm the association. For risk factors with consistent evidence, improvements in study design, exposure assessment, and case definition could lead to a better understanding of the association and help inform health-based threshold levels. **Conclusions:** By providing an overview of knowledge gaps in the associations between occupational exposures and their health effects, our narrative review will help setting priorities in occupational health research. Future epidemiological studies should prioritize to include large sample sizes, assess exposures prior to disease onset, and quantify exposures. Potential sources of biases and confounding need to be identified and accounted for in both original studies and systematic reviews.

**Peters et al. 2024.**

**Annals of Work Exposures and Health, vol. 68, no. 6.**

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**Keywords:** Aetiology; epidemiology; exposome; occupational health.

**Evidence Level:** 6A

**Link:** https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11229329/

**Incidence risk of hepatobiliary malignant neoplasms in the cohort of workers chronically exposed to ionizing radiation**

**Background:** The increased risk of liver malignancies was found in workers of the first Russian nuclear production facility, Mayak Production Association, who had been chronically exposed to gamma rays externally and to alpha particles internally due to plutonium inhalation. **Method:** In the present study, we updated the radiogenic risk estimates of the hepatobiliary malignancies using the extended follow-up period (1948-2018) of the Mayak worker cohort and the improved Mayak worker dosimetry system-2013. **Results:** The cohort comprised 22,377 workers hired at the Mayak PA between 1948 and 1982. The analysis considered 62 liver malignancies (32 hepatocellular carcinomas, 13 intrahepatic cholangiocarcinomas, 16 angiosarcomas, and 1 anaplastic cancer) and 33 gallbladder adenocarcinomas. The analysis proved the positive significant association of the liver malignancy risk (the total of histological types, hepatocellular carcinoma) with the liver absorbed alpha dose from internal exposure. The excess relative risk per Gy (95% confidence interval) of alpha dose (the linear model) was 7.56 (3.44; 17.63) for the total of histological types and 3.85 (0.95; 13.30) for hepatocellular carcinoma. Indications of non-linearity were observed in the dose-response for internal exposure to alpha radiation. No impact of external gamma-ray exposure on the liver malignancy incidence was found. In the study cohort, the number of angiosarcomas among various types of liver malignancies was very high (25.8%), and most of these tumors (73.3%) were registered in individuals internally exposed to alpha radiation at doses ranging between 6.0 and 21.0 Gy. **Conclusion:** No

association with chronic occupational radiation exposure was observed for the incidence of gallbladder malignancies.
**Zhuntova et al. 2024.**
**Scientific Reports, vol. 14, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** External gamma-ray exposure; hepatobiliary malignancies; hepatocellular carcinoma; internal alpha particle exposure; intrahepatic cholangiocarcinoma; liver angiosarcoma; mayak workers cohort; occupational radiation exposure.
**Evidence Level:** 4B
**Link:** https://www.nature.com/articles/s41598-024-63503-z

**Relationships between asbestos exposure and pleural plaques: Dose and time effects using fractional polynomials**
**Background:** The aim of this study was to confirm the relationship between several parameters of exposure to asbestos and pleural plaques (PP) using data from a large cohort of retired workers occupationally exposed to asbestos in France. **Method:** A large screening programme, including high-resolution CT (HRCT) examinations at inclusion and two other HRCT campaigns, was organised from 2003 to 2016 in four regions of France for voluntary, formerly asbestos-exposed workers. Exposure to asbestos has been evaluated by industrial hygienists based on the complete work history. The time since first exposure, the time since last exposure, Cumulative Exposure Index and maximum level of exposure to asbestos, were used in logistic regression using fractional polynomials to model the relationship with PP. **Results:** The study included 5392 subjects with at least one HRCT available. There was a significant non-linear effect of time since first exposure, time since last exposure and Cumulative Exposure Index to asbestos on the presence of PP. The risk of PP increased with increasing Cumulative Exposure Index to asbestos adjusted for time since first exposure, age and smoking status. Models also show that PP odds rise with increasing time since first exposure adjusted for cumulative index exposure, age and smoking status. PP odds decrease when time since last exposure increases. **Conclusion:** The study provides new data on the link between asbestos exposure and the presence of PP using fractional polynomials with non-linear relationships for time exposure parameters and asbestos exposure parameters.
**Menant et al. 2024.**
**Occupational and Environmental Medicine, vol. 81, no. 6.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Asbestos; epidemiology; occupational Health.
**Evidence Level:** 4B
**Link:** https://oem.bmj.com/content/81/6/313.long

**The asbestos-asbestosis exposure-response relationship: A cohort study of the general working population**
**Background:** The association between asbestos exposure and asbestosis in high-exposed industrial cohorts is well-known, but there is a lack of knowledge about the exposure-response relationship for asbestosis in a general working population setting. We examined the exposure-response relationship between occupational asbestos exposure and asbestosis in asbestos-exposed workers of the Danish general working population. **Methods:** We followed all asbestos-exposed workers from 1979 to 2015 and identified incident cases of asbestosis using the Danish National Patient Register. Individual asbestos exposure was estimated with a quantitative job exposure matrix (SYN-JEM) from 1976 onwards and back-extrapolated to age 16 for those exposed in 1976. Exposure-response relations for cumulative exposure and other exposure metrics were analyzed using a discrete time hazard model and adjusted for potential confounders. **Results:** The range of cumulative exposure in the population was 0.001 to 18 fibers per milliliter-year (f/ml-year). We found increasing incidence rate ratios (IRR) of asbestosis with increasing cumulative asbestos exposure with a fully adjusted IRR per 1 f/ml-years of 1.18 [95% confidence interval (CI) 1.15- -1.22]. The IRR was 1.94 (95% CI 1.53-2.47) in the highest compared to the lowest exposure tertile. We similarly observed increasing risk with increasing cumulative exposure in the inception population. **Conclusions:** This study found exposure-response relations between cumulative asbestos exposure and incident asbestosis in the Danish

general working population with mainly low-level exposed occupations, but there is some uncertainty regarding the exposure levels.
**Iversen et al. 2024.**
**Scandinavian Journal of Work Environment and Health, vol. 50, no. 5.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Asbestos; asbestosis; working population; exposure response.
**Evidence Level:** 4B
**Link:** https://www.sjweh.fi/article/4153

**Occupational exposure to respirable crystalline silica and incident idiopathic interstitial pneumonias and pulmonary sarcoidosis: A national prospective follow-up study**
**Background:** Respirable crystalline silica is a well-known cause of silicosis but may also be associated with other types of interstitial lung disease. We examined the associations between occupational exposure to respirable crystalline silica and the risk of idiopathic interstitial pneumonias, pulmonary sarcoidosis and silicosis. **Methods:** The total Danish working population was followed 1977-2015. Annual individual exposure to respirable crystalline silica was estimated using a quantitative job exposure matrix. Cases were identified in the Danish National Patient Register. We conducted adjusted analyses of exposure-response relations between cumulative silica exposure and other exposure metrics and idiopathic interstitial pneumonias, pulmonary sarcoidosis and silicosis. **Results:** Mean cumulative exposure was 125 µg/m$^3$-years among exposed workers. We observed increasing incidence rate ratios with increasing cumulative silica exposure for idiopathic interstitial pneumonias, pulmonary sarcoidosis and silicosis. For idiopathic interstitial pneumonias and pulmonary sarcoidosis, trends per 50 µg/m$^3$-years were 1.03 (95% CI 1.02 to 1.03) and 1.06 (95% CI 1.04 to 1.07), respectively. For silicosis, we observed the well-known exposure-response relation with a trend per 50 µg/m$^3$-years of 1.20 (95% CI 1.17 to 1.23). **Conclusion:** This study suggests that silica inhalation may be related to pulmonary sarcoidosis and idiopathic interstitial pneumonias, though these findings may to some extent be explained by diagnostic misclassification. The observed exposure-response relations for silicosis at lower cumulative exposure levels than previously reported need to be corroborated in analyses that address the limitations of this study.
**Iversen et al. 2024.**
**Occupational and Environmental Medicine, vol. 81, no. 6.**
**User License:** *Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) (https://creativecommons.org/licenses/by-nc/4.0/*
**Keywords:** Lung diseases, interstitial; occupational health; silicosis.
**Evidence Level:** 4B
**Link:** https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11287551/

**Occupational exposure to organic solvents and the risk of developing testicular germ cell tumors (TESTIS study): Effect of combined exposure assessment on risk estimation**
**Background:** Etiological factors of testicular germ cell tumors (TGCT) remain largely unknown, but a causal role of occupational exposures to solvents has been suggested. Previous studies analyzing these exposures reported discordant results, potentially related to exposure assessment methods. The aim of this study was to investigate the role of occupational exposure to solvents on the risk of developing TGCT among young men. **Methods:** This study examined occupational exposures to solvents and TGCT risk based on the lifetime work histories of 454 cases and 670 controls, aged 18-45 years, of the French national TESTIS case-control study. Solvent exposure was estimated using: (i) exposure assignment by job-exposure matrix (JEM) and (ii) JEM combined with self-reported exposure data from specific questionnaires (SQ) and expert assessment (EA). Odds ratios (OR) and 95% confidence intervals (CI) were estimated using conditional logistic regression models. **Results:** Both approaches (JEM and JEM+SQ+EA) showed a consistent association between TGCT and trichloroethylene exposure (exposed versus not exposed; JEM=OR 1.80 [95% confidence interval (CI) 1.12-2.90] and JEM+SQ+EA= OR 2.59 (95% CI 1.42-4.72). Both approaches also observed positive associations with ketone esters and fuels & petroleum-based solvents. **Conclusion:** The results suggest that some organic solvents might be involved in the pathogenesis of TGCT among occupationally exposed men. The combined use of JEM+SQ+EA seemed to limit misclassification by

considering individual exposure variability and is, therefore, an appealing approach to assess occupational exposures in epidemiological studies.
**Guth et al. 2024.**
**Scandinavian Journal of Work Environment and Health, vol. 50, no. 5.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Occupational exposure; testicular germ cell tumors; organic solvents.
**Evidence Level:** 4B
**Link:** https://www.sjweh.fi/article/4161

**The after-effects of occupational whole-body vibration on human cognitive, visual, and motor function: A systematic review**
**Background:** Whole-body vibration (WBV) is prevalent in labour-related activities and can have adverse effects on the health and performance of the individuals exposed. However, evidence regarding the extent to which human functionality is affected following occupational WBV exposure has not been collated. **Method:** The current systematic review sought to synthesize existing literature and assess the strength and direction of evidence regarding the acute after-effects of occupational WBV exposure on cognition, visual function, postural stability, and motor control. We conducted a comprehensive search of AMED, CINAHL, MEDLINE, PubMED, Psychology and Behavioural Sciences Collection, SPORTDiscus, APA PsychInfo, Cochrane Library, EMBASE, HMIC, Global Health, ProQuest Central, Scopus, Web of Science, and the US National Technical Information Service on April 26, 2023. Studies that quantified vibration exposure and measured acute changes in cognition, visual function, postural stability, and motor control from baseline to post-vibration were considered without date restriction. **Results:** Out of the 2663 studies identified, 32 were eligible for inclusion. Based on the Risk of Bias in Non-Randomized Studies of Exposure (ROBINS-E) tool, the studies demonstrated low (66%), moderate (25%) and high risk of bias (9%). The findings indicate that after exposure to WBV, postural stability either deteriorates or remains unchanged. Inconsistent effects of WBV on cognition were reported, while visual function and motor control showed no pronounced changes following WBV. This might be attributed to assessment limitations such as learning effects in neuropsychological and motor tasks, and non-functional measures of vision employed. There was a lack of consistency in the characterization of vibration exposure and the assessment of associated effects on functional performance. **Conclusion:** Current evidence is therefore insufficient to provide definitive guidance for updating occupational health and safety regulations regarding WBV. However, this review highlights the potential for WBV to jeopardize post-exposure human performance and, consequently, safety. The completion of the review was supported by a UKRI EPSRC training grant. The review has been registered on PROSPERO (ref CRD42023391075).
**Halmai et al. 2024.**
**Applied Ergonomics, vol. 118.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Human response; occupational; safety; vibration exposure.
**Evidence Level:** 1A
**Link:** https://www.sciencedirect.com/science/article/pii/S0003687024000413?via%3Dihub

**Occupational exposure to benzene and mortality risk of lymphohaematopoietic cancers in the Swiss National Cohort**
**Background:** Previous studies established a causal relationship between occupational benzene exposure and acute myeloid leukemia (AML). However, mixed results have been reported for associations between benzene exposure and other myeloid and lymphoid malignancies. Our work examined whether occupational benzene exposure is associated with increased mortality from overall lymphohaematopoietic (LH) cancer and major subtypes. **Methods:** Mortality records were linked to a Swiss census-based cohort from two national censuses in 1990 and 2000. Cases were defined as having any LH cancers registered in death certificates. We assessed occupational exposure by applying a quantitative benzene job-exposure matrix (BEN-JEM) to census-reported occupations. Exposure was calculated as the products of exposure proportions and levels (P × L). Cox proportional hazards models were used to calculate LH cancer death hazard ratios (HR) and 95% confidence intervals (CI) associated with benzene exposure, continuously and in

ordinal categories. **Results:** Our study included approximately 2.97 million persons and 13 415 LH cancer cases, including 3055 cases with benzene exposure. We observed increased mortality risks per unit (P × L) increase in continuous benzene exposure for AML (HR 1.03, 95% CI 1.00-1.06) and diffuse large B-cell lymphoma (HR 1.09, 95% CI 1.04-1.14). When exposure was assessed categorically, increasing trends in risks were observed with increasing benzene exposure for AML (P=0.04), diffuse large B-cell lymphoma (P=0.02), and follicular lymphoma (P=0.05). **Conclusion:** In a national cohort from Switzerland, we found that occupational exposure to benzene is associated with elevated mortality risks for AML, diffuse large B-cell lymphoma, and possibly follicular lymphoma.
**Ge et al. 2024.**
**Scandinavian Journal of Work Environment and Health, vol. 50, no. 5.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Occupational exposure; benzene; mortality risk; lymphohaematopoietic; cancer; Swiss.
**Evidence Level:** 4B
**Link:** https://www.sjweh.fi/article/4164

**Occupational exposure to pesticides and neurobehavioral outcomes: Impact of different original and recalled exposure measures on the associations**
**Background:** Several measures of occupational exposure to pesticides have been used to study associations between exposure to pesticides and neurobehavioral outcomes. This study assessed the impact of different exposure measures for glyphosate and mancozeb on the association with neurobehavioral outcomes based on original and recalled self-reported data with 246 smallholder farmers in Uganda. **Methods:** The association between the 6 exposure measures and 6 selected neurobehavioral test scores was investigated using linear multivariable regression models. Exposure measures included original exposure measures for the previous year in 2017: (i) application status (yes/no), (ii) number of application days, (iii) average exposure-intensity scores (EIS) of an application and (iv) number of EIS-weighted application days. Two additional measures were collected in 2019: (v) recalled application status and (vi) recalled EIS for the respective periods in 2017. **Results:** Recalled applicator status and EIS were between 1.2 and 1.4 times more frequent and higher for both pesticides than the original application status and EIS. Adverse associations between the different original measures of exposure to glyphosate and 4 neurobehavioral tests were observed. Glyphosate exposure based on recalled information and all mancozeb exposure measures were not associated with the neurobehavioral outcomes. **Conclusions:** The relation between the different original self-reported glyphosate exposure measures and neurobehavioral test scores appeared to be robust. When based on recalled exposure measures, associations observed with the original exposure measures were no longer present. Therefore, future epidemiological studies on self-reported exposure should critically evaluate the potential bias towards the null in observed exposure-response associations.
**Fuhrimann et al. 2024.**
**Annals of Work Exposures and Health, vol. 68, no. 6.**
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**Keywords:** Uganda; exposure assessment; exposure misclassification; farmers; glyphosate; mancozeb; neurobehavioral outcomes; pesticides; recall.
**Evidence Level:** 5B
**Link:** https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11229323/

## Physical Activity

**Association between different types of physical activity and occupational stress in Japanese workers: A cross-sectional study**
**Background:** This cross-sectional study investigated the association between different types of physical activity (PA) and occupational psychological and physical stress responses among workers in Japan.
**Method:** Stress responses were assessed using the Brief Job Stress Questionnaire. Work-related PA (time spent sitting, sitting bouts, standing, walking, engaging in heavy labor, and moderate-to-vigorous PA [MVPA]) and exercise-based PA (frequencies [times/week] of flexibility and muscle-strengthening activity,

and walking) were measured using a questionnaire. Multiple linear regression was performed to examine the association between each type of PA and stress responses. **Results:** Participants who engaged in >108 min/day of work-related MVPA exhibited a statistically significant association with higher psychological stress responses when compared to those who engaged in 0-42 min/day of work-related MVPA. For exercise-based PA, participants who engaged in flexibility activity or walking five or more times/week, or muscle-strengthening activity one to three times/week, demonstrated significantly lower psychological stress responses compared to those who did not exercise. Participants who engaged in flexibility activity five or more times/week demonstrated significantly lower physical stress responses compared to those who did not exercise**. Conclusion:** This study suggests that work-related MVPA is associated with higher psychological stress responses, while exercise-based PA is associated with lower psychological or physical stress responses.

**Abe et al. 2024.**

**Industrial Health, vol. 62, no. 4.**

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**Keywords:** Health management; physical activity; socio-economic status; stress check program; workers.

**Evidence Level:** 4B

**Link:** https://www.jstage.jst.go.jp/article/indhealth/62/4/62_2023-0092/_article

## Musculoskeletal Health

*This month we explore issues associated with Musculoskeletal Health and interventions aimed at preventing work-related musculoskeletal disorders, physical and psychosocial exposures and disorders of the shoulder, risk assessment and interventions to prevent work-related musculoskeletal disorders and pace-time analysis of work-related musculoskeletal disorders. In other studies we explore occupational psychosocial exposures and chronic low-back pain, the social determinants and work-related musculoskeletal disorders and wearing a back support exoskeleton.*

**Evaluating the categorisation of interventions in individual working practice aimed at preventing work-related musculoskeletal disorders: An international experts consultation**

**Background:** In a previous scoping review, eight categories of interventions in individual work practice were defined. The aim of the present study is to evaluate the relevance and completeness of these eight categories and to increase the clarity of the nomenclature and definitions of each category. An international expert consultation has been carried out for this purpose. **Method:** Thirty-eight experts from 13 countries participated. Data collection was conducted using a survey design comprising structured questions. Consensus was reached if 75% of the experts answered 'Strongly agree' or 'Agree' on a 5-point Likert scale. **Results:** For the topic 'Relevance', there was consensus for six of the eight categories (range 78%-86%), the exceptions were the categories: 'Exercising' (72%) and 'Professional manners' (64%). With regard to the topic 'Nomenclature', consensus was reached for six categories and for the topic 'Definition' this was five categories. The present definitions have been improved based on the expert recommendations. With respect to the topic 'Completeness': although a limited number of suggestions were given, this did not lead to one or more categories being added to the existing eight categories. The final 'Nomenclature' for the categories is: 'Variation', 'Professional behaviour', 'Motoric skills', 'Vocational working techniques', 'Physical workplace', 'Physical training', 'Assistive devices and tools' and 'Task content and task organisation'. **Conclusion:** This expert consultation has provided a solid basis for endorsing the categorisation of interventions in IWP and is an important step in building a framework to develop and evaluate interventions in IWP.

**van de Wijdeven et al. 2024.**

**Applied Ergonomics, vol. 120.**

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**Keywords:** Delphi technique; musculoskeletal diseases; occupational health; prevention and control; referral and consultation; risk factors.

**Evidence Level:** 4A

**Link:** https://www.sciencedirect.com/science/article/pii/S0003687024001157?via%3Dihub

**Physical and psychosocial work-related exposures and the occurrence of disorders of the shoulder: A systematic review update**
**Background and Method:** This review is an update of a previous systematic review and assesses the evidence for the association of work-related physical and psychosocial risk factors and specific disorders of the shoulders. Medline, Embase, Web of Science Core Collection, Cochrane Central and PsycINFO were searched and study eligibility and risk of bias assessment was performed by two independent reviewers. **Results:** A total of 14 new articles were added with the majority focusing on rotator cuff syndrome (RCS) with seven studies. Nine articles reported psychosocial exposures in addition to physical exposures. The strongest evidence was found for the association between elevation, repetition, force and vibration and the occurrence of SIS and tendinosis/tendonitis. Evidence also suggests that psychosocial exposures are associated with the occurrence of RCS and tendinosis/tendonitis. **Conclusions:** Other findings were inconsistent which prevents drawing strong conclusions.
**Versloot et al. 2024.**
**Applied Ergonomics, vol. 118.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Psychosocial risk-factors; shoulder disorders; work-related risk factors.
**Evidence Level:** 1A
**Link:** https://www.sciencedirect.com/science/article/pii/S0003687024000541?via%3Dihub

**What have we learned about risk assessment and interventions to prevent work-related musculoskeletal disorders and support work participation?**
**Background:** The Scandinavian Journal of Work, Environment & Health (SJWEH) was established half a century ago. This paper provides an overview of research on musculoskeletal disorders (MSD) published over these 50 years. Three themes are described: risk assessment, interventions to prevent work-related MSD, and interventions to support work participation. Finally, implications for future research are highlighted. **Methods:** A systematic literature search was performed for all papers on MSD published in SJWEH. Each paper was coded on several criteria including research topic, type of MSD, risk factor(s), and number of citations. Findings were tabulated, and discussions within the author team defined the main results and future research directions. **Results:** The search resulted in 1056 papers, of which 474 were included. The most reported-on MSD was low-back pain (LBP, 18%) and the most reported-on work-related risk factors were physically demanding work (14%) and psychosocial factors (12%). Research has contributed to improving case definitions, refining work-related exposure criteria, and recognizing the varying importance of physical and psychosocial factors across different MSD. Research on the association between work-related risk factors and LBP continues to emerge. Effective interventions for prevention of MSD are characterised by sufficient exposure reduction, while supporting work participation requires integrating health care, with multidisciplinary actions directed at factors involving the worker, employer, and workplace. **Conclusion:** Research has provided valuable insights into risk assessment, interventions for preventing work-related MSD, and supporting work participation. Intervention studies remain warranted and new areas include adopting whole-system approaches to prevent work-related MSD and promoting the concept of musculoskeletal health.
**Kuijer et al. 2024.**
**Scandinavian Journal of Work Environment and Health, vol. 50, no. 5.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Risk assessment; musculoskeletal disorders.
**Evidence Level:** 1B
**Link:** https://www.sjweh.fi/article/4172

**Space-time analysis of work-related musculoskeletal disorders in Brazil: An ecological study**
**Background:** This study aimed to analyze the incidence of work-related musculoskeletal disorders (WMSD) in Brazil from 2007 to 2019, examining the spatial, temporal, and spatiotemporal patterns of their occurrence. **Method:** An ecological time series study was conducted using spatial analysis techniques. WMSD morbidity data from 2007 to 2019 were collected from the Brazilian Information System for

Notificable Diseases of the Brazilian Health Informatics Department. Incidence rates were standardized and smoothed using the local empirical Bayes' theorem. Time trends were analyzed by segmented linear regression. Spatial analysis was performed using Moran's univariate global (I) and local (LISA) indexes. The spatiotemporal scan statistic was used to identify high-risk spatiotemporal clusters for WMSD. **Results:** A total of 93,387 cases of WMSD were recorded in Brazil. Temporal trends showed an increase in all regions except the Northeast, which remained stable. The incidence of WMSD showed a spatial dependence, with spatial and space-time clusters identified, especially in the Southeast region, overlapping the largest economic-industrial center of the country. The spatiotemporal clustering observed in one region suggests the highest level of industrial and economic development. **Conclusion:** Our findings highlight the need to implement intersectoral surveillance policies, inspect working conditions, and invest in the prevention and promotion of workers' health.
**Lima et al. 2024.**
**Cad. Saúde Pública, vol. 40, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Analysis; muculoskeletal disorders; Brazil.
**Evidence Level:** 4B
**Link:** https://www.scielo.br/j/csp/a/fd7tbcHvmrcYvvhZNnZG6yp/?lang=en

**Occupational psychosocial exposures and chronic low-back pain: A systematic review and meta-analysis**
**Background:** This study aimed to explore the association between occupational psychosocial exposures and chronic low-back pain (LBP) by conducting a systematic review and meta-analysis. **Methods:** The research protocol was registered in PROSPERO. A systematic literature search was performed in six databases, identifying articles complying with predefined inclusion criteria. In our PECOS, we defined outcome as chronic LBP ≥3 months, exposures as occupational psychosocial exposures, and restricted study design to case-control and cohort studies. Two authors independently excluded articles, extracted data, assessed risk of bias, and graded evidence levels. Meta-analyses were performed using random-effects models. **Results:** The 20 included articles encompassed six different occupational psychosocial exposures (job control, demand, strain, support, stress, and satisfaction), only 1 had low risk of bias. For all occupational psychosocial exposures, odds ratios ranged from 0.8 to 1.1. Sensitivity analyses based on risk of bias was conducted for two outcomes ie, job control and job demand, finding no differences between high and low-to-moderate risk of bias studies. Using GRADE, we found a very low level of evidence of the association for all occupational psychosocial exposures. **Conclusion:** In this study, we found no association between occupational psychosocial exposures and chronic LBP. However, it is important to underline that the level of evidence was very low. High quality studies are highly warranted.
**Jahn et al. 2024.**
**Scandinavian Journal of Work Environment and Health, vol. 50, no. 5.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Psychosocial exposures; chronic low-back pain.
**Evidence Level:** 1A
**Link:** https://www.sjweh.fi/article/4165

**Social determinants and work-related musculoskeletal disorders in Brazil**
**Background:** This study aimed to analyze the prevalence of work-related musculoskeletal disorders (WMSD) and their association with individual and contextual factors in the Brazilian population. **Method:** This quantitative cross-sectional study used secondary data from the Brazilian National Health Survey from August 2013 to February 2014. The dependent variable included WMSD, and independent variables were analyzed as individual and contextual factors. **Results**: WMSD was mostly prevalent in females, individuals aged 43 to 59 years, with chronic physical or mental disorders, reporting frequent sleep disorders, and performing integrative and complementary health practices, physical exercise or sports, and heavy physical activity or housework. Regarding contextual factors, high social classes and proportion of individuals with formal work were associated with a high prevalence of WMSD, whereas a high Gini index was associated with a low prevalence. **Conclusion:** Thus, a high prevalence of WMSD in the Brazilian population was

associated with individual and contextual factors, which should be the target of health professionals for actions of promotion, prevention, and intervention at individual or collective care levels.
**da Silva et al. 2024.**
**PLoS One, vol. 19, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Work; musculoskeletal; WMSD; prevalence; cross sectional.
**Evidence Level:** 4B
**Link:** https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0306840

**Equivalent weight: Application of the assessment method on real task conducted by railway workers wearing a back support exoskeleton**
**Background:** Commonly used risk indexes, such as the NIOSH Lifting Index, do not capture the effect of exoskeletons. This makes it difficult for Health and Safety professionals to rigorously assess the benefit of such devices. The community requires a simple method to assess the effectiveness of back-support exoskeleton's (BSE) in possibly reducing ergonomic risk. The **Method** introduced in this work is termed "Equivalent Weight" (EqW) and it proposes an interpretation of the effect built on the benefit delivered through reduced activation of the erector spinae (ES). This manifests itself as an apparent reduction of the lifted load perceived by the wearer. This work presents a pilot study where a practical application of the EqW method is used to assess the ergonomic risk in manual material handling (MMH) when using a back support exoskeleton (StreamEXO). **Results and Conclusions:** The results are assessed by combining observational measurements from on-site testing with five different workers and quantitative measures of the muscle activity reduction achieved during laboratory evaluation with ten workers. These results will show that when lifting, lowering, and carrying a 19 kg load the StreamEXO can reduce risk by up to two levels (from "high" to "low") in the target sub-tasks. The Lifting index (LI) was reduced up to 64% when examining specific sub-tasks and the worker's movement conduction.
**Di Natali et al. 2024.**
**Applied Ergonomics, vol. 118.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Equivalent weight; ergonomic assessment; exoskeletons.
**Evidence Level:** 5B
**Link:** https://www.sciencedirect.com/science/article/pii/S0003687024000553?via%3Dihub

## Guiding and Supporting Mental Health and Wellbeing

### Mental Health

*This month we explore issues associated with mental health and chosen isolation at the workplace, the detection and disclosure of workplace mental health challenges, predicting mental health status through interview-based evaluation of work stress, work functioning 10 years after rehabilitation of stress-induced exhaustion disorder and perceptions of mental health, suicide and working conditions in the construction industry.*

**Loneliness without distress, chosen isolation (solitude) at the workplace, and mental health and job performance: A cross-sectional study of Japanese employees**
**Background:** While loneliness and social isolation in the workplace affect the mental health and job performance of employees, the effects of loneliness without distress and solitude (i.e., chosen isolation) on these outcomes are unclear**. Method:** The cross-sectional association was examined by using online survey of full-time employees in Japan (n=846). **Results:** The results showed that the "loneliness with distress" group had significantly higher psychological distress and lower job performance than the other groups. Work engagement was lower both in the "loneliness with distress" and "loneliness without distress" groups, compared to the "non-loneliness" group. The "unchosen isolation" and the "solitude" groups had poorer scores of psychological distress, work engagement, and work performance, compared to the "non-isolation" group. **Conclusion:** The preliminary findings showed that loneliness without distress and solitude

were associated with poor levels of mental health and job performance and should become a target of mental health promotion interventions in the workplace.
**Sasaki et al. 2024.**
**Industrial Health, vol. 62, no. 4.**
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**Keywords:** Counterproductive behaviors; psychological distress; social isolation; work engagement.
**Evidence Level:** 4B
**Link:** https://www.jstage.jst.go.jp/article/indhealth/62/4/62_2023-0181/_article

**Detection and disclosure of workplace mental health challenges: An exploratory study from India**
**Background:** Workplace mental health challenges have emerged as a significant concern post-pandemic. Despite this, the pervasive stigma surrounding mental illness leads to the concealment of symptoms and reluctance to seek professional help among employees. This study aims to explore the perception of different stakeholders towards the 'Detection and disclosure' of workplace mental health challenges in the Indian context. **Method:** Fifteen semi-structured interviews were conducted with human resource professionals, counselors, and employees who had previously experienced mental health challenge(s). Thematic analysis was done to identify recurring themes and sub-themes. **Results:** Three critical pathways were identified: minimizing the inhibitory factors, including lack of awareness, denial, low self-efficacy, stigma, and underestimating organizational capability; maximizing the encouraging factors, including psychological safety, perceived social support, and communicating success stories; and implementing supportive organizational practices, including generating awareness and literacy, build the organizational capability, strengthen the role of managers, leadership advocacy, policies, and processes.
**Conclusion:** By fostering a culture of support and prioritizing employee well-being, organizations in India can create healthier and more resilient work environments, benefiting both individuals and the larger society.
**Poddar et al. 2024.**
**BMC Public Health, vol. 24, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Detection; disclosure; India; supportive organizational practices; workplace mental health challenges.
**Evidence Level:** 5B
**Link:** https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-19422-9

**Predicting physical and mental health status through interview-based evaluation of work stress: Initial attempts to standardize the interviewing method**
**Background and Method:** This study conducted an interview-based stress evaluation that considered the psychosocial models of work stress and verified the evaluation's predictive validity. A four-stage assessment comprising a pre-survey, pre-interview questionnaire, stress assessment interview, and post-survey after one month was conducted with 50 Japanese workers. Additionally, 16 occupational health professionals provided stress evaluations based on recorded interview videos. Variables based on intraclass correlation coefficients (ICCs) were computed in multiple ways to compare the agreement among the evaluators. The generalized estimating equation (GEE) was conducted to evaluate the prediction models. **Results:** The overall ICC among the evaluators was 0.58. The GEE revealed that the mean score of the evaluators in the interview-based stress evaluation significantly predicted psychological symptoms ($\beta$ =2.02, p=0.019), burnout ($\beta$ =0.77, p<0.001), and well-being ($\beta$ =-0.64, p=0.007) one month later, even after adjusting for the self-reported stress levels measured in the pre-survey. **Conclusion:** The predictive validity of the proposed interview-based stress evaluation was confirmed. Although there are several challenges in standardizing this evaluation, semi-structured interviews are an effective tool for understanding work stress.
**Kiuchi et al. 2024.**
**Industrial Health, vol. 62, no. 4.**

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**Keywords:** Artificial intelligence; burnout; chronic stress; interview-based assessment; job stress; mental health; stress assessment; well-being.
**Evidence Level:** 5B
**Link:** https://www.jstage.jst.go.jp/article/indhealth/62/4/62_2023-0144/_article

**Symptoms, work situation and work functioning 10 years after rehabilitation of stress-induced exhaustion disorder**

**Background:** Stress-induced exhaustion disorder (SED) is the most common reason for long-term sick leave in Sweden and the recovery process may be long and troublesome. This study explores the symptoms of burnout, depression and anxiety among patients with SED 10 years after termination of a multimodal rehabilitation program. Another aim of the study was to investigate work situation, work functioning, and any remaining exhaustion and sleeping disorders among those who were gainfully employed at the 10-year follow-up. **Methods:** This longitudinal study included 107 patients (91 women and 16 men), who had been diagnosed with SED 10 years prior to the study. After establishing the diagnosis they all underwent and completed an multimodal rehabilitation program. Data on symptoms of burnout, anxiety and depression were collected before and after the multimodal rehabilitation program, and at follow-ups after additional 1 year and an additional 10 years. At the 10-year follow-up, work situation, work functioning, and symptoms of exhaustion and sleep disorders were assessed in those who were gainfully employed (89 patients). **Results:** Symptoms of burnout, anxiety, and depression remained stable from the 1- to the 10-year follow-up after completed rehabilitation. Among participants who were gainfully employed, 73% had changed workplaces, and 31.5% had reduced their working hours. Common reasons for these changes were lack of energy or because they had chosen to prioritise their lives differently. Work functioning was rated as moderate, one third self-reported SED to some extent, and one fifth reported moderate-to-severe insomnia. **Conclusion:** A relatively large proportion of former patients with SED have residual health problems 10 years after rehabilitation and some have not been able to return to full-time work. Preventive and early rehabilitative interventions with adjustments and measures at the organisational level are probably needed to achieve a more sustainable working life.
**Eskilsson et al. 2024.**
**BMC Psychiatry, vol. 24, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Burnout; follow-up studies; mental health recovery; rehabilitation; return to work; stress-induced exhaustion disorder.
**Evidence Level:** 5B
**Link:** https://bmcpsychiatry.biomedcentral.com/articles/10.1186/s12888-024-05975-x

**Perceptions of mental health, suicide and working conditions in the construction industry: A qualitative study**

**Background:** The aim of the study was to explore perceptions of mental ill health, suicidal behaviour and working conditions among male construction workers, in order to gain an in-depth understanding of these phenomenon and to identify relevant avenues for workplace interventions. **Method:** Data were collected in individual and group interviews, and 43 individuals from the Swedish construction industry, workers, union representative and managers, participated in the study. Inductive thematic analysis was used to analyse the data. **Results:** Five main themes were found: Difficult to talk about mental health, Demanding working environment affects mental health, Substance abuse among construction workers, Importance of management, and need for routines and social support in the workplace. Many participants reported that there was a stigma related to mental health. Suicides that had occurred among colleagues were perceived to come out of the blue. The working environment in the construction industry was perceived to have a negative effect on mental health, and it was reported that the management played an important role in both the cause and prevention of mental health problems. **Conclusions:** The results from this Swedish study are in accordance with previous international research regarding a macho culture, stigma of mental health and a demanding working environment in the construction industry. The study adds to existing

knowledge by highlighting that suicides were perceived to be very unexpected, that poor physical health affected mental health and that many participants did not know how to deal with mental health issues in the workplace.
**PLoS One et al. 2024.**
**Aurelius, vol. 19, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords**: Mental health; suicide; working conditions; construction industry.
**Evidence Level:** 5B
**Link**: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0307433

## Bullying, Harassment and Occupational Violence

*This month we explore issues associated with prevalence and outcomes of workplace bullying of leaders and gender-based violence and harassment at work and health and occupational outcomes.*

**Leaders as the targets of workplace bullying: Prevalence and outcomes**
**Background:** Bullying of leaders is an underexplored topic in organizational research. To fill this knowledge gap, the aims of this study were to determine the prevalence of bullying of leaders and to examine whether holding a formal leadership position influences the relationships between exposure to bullying and the outcomes job satisfaction and depression. **Methods:** Data from two separate surveys were employed: (1) A cross-sectional occupation specific sample comprising 678 Norwegian child welfare social workers; (2) A nationally representative probability sample of 1,608 Norwegian employees with two time-points (6 months' time-lag). **Results:** Analyzing multiple indicators of workplace bullying, holding a formal leadership position had no impact on the initial risk of being bullied. Analyses of prospective data showed that leaders report a somewhat stronger increase in levels of bullying over time compared to non-leaders, although the effect size was small. With exception of a small buffering effect on the cross-sectional association between exposure to bullying behaviors and job satisfaction in the second sample, holding a leadership position had no effect on the strength of the association between bullying and outcomes. **Conclusion:** The findings show that leaders have the same risk of being bullied and are influenced by bullying in roughly the same manner as non-leaders. Organizational measures and interventions against bullying should therefore consider leaders as a risk group in line with other employees.
**Nielsen et al. 2024.**
**International Archives of Occupational and Environmental Health, vol. 97, no. 5.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Aggression; health; management; mistreatment; supervisors.
**Evidence Level:** 4B
**Link:** https://link.springer.com/article/10.1007/s00420-024-02066-y

**Gender-based violence and harassment at work and health and occupational outcomes: A systematic review of prospective studies**
**Background:** Many people experience forms of gender-based violence and harassment (GBVH) in the context of their work. This includes a wide range of experiences, from subtle expressions of hostility to physical assault, that can also be of a sexual nature (e.g., sexual harassment or assault). This systematic review aimed to summarize findings about the prospective associations of work-related GBVH with people's health and occupational situation. **Methods:** We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Scopus, Web of Science, MEDLINE and PsycINFO were searched for prospective studies in English from 1990 to May 24, 2023. Studies were included if they concerned a working population, exposure to any form of GBVH in the work context, and a health outcome or manifest occupational outcome. Quality was assessed with a modified version of the Cochrane 'Tool to Assess Risk of Bias in Cohort Studies', and studies assessed as low quality were excluded from the narrative synthesis. For the narrative synthesis, we grouped the results by similar exposures and outcomes and reported the strength and statistical significance of the associations. **Results:** Of the 1 937 screened records, 29 studies were included in the narrative synthesis. Studies were mainly conducted in the USA and

northern Europe and investigated exposure to sexual violence or harassment (SVH). Only two included studies investigated non-sexual kinds of GBVH. Consistently, studies showed associations of work-related SVH with poor mental health and there were indications of an association with hazardous substance use. There was no consistent evidence for an association of SVH with subsequent sickness absence, and there were too few studies concerning physical health and occupational outcomes to synthesize the results. **Conclusions:** There is consistent evidence of work-related SVH as a risk factor for subsequent poor mental health. There is no indication that the health consequences of SVH differ between women and men, although women are more often affected. There is a need for conceptual consistency, the consideration of non-sexual behaviors and prospective studies that test clear hypotheses about the temporal sequence of events.

**Blindow et al. 2024.**

**BMC Public Health, vol. 24, no. 1.**

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**Keywords:** Adverse social behavior; discrimination; mental health; sexism; sexual assault; sexual harassment; work environment.

**Evidence Level:** 1A

**Link:** https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-19304-0

## Psychosocial Issues

*This month we explore psychosocial issues associated with coronary heart diseases and depression, interventions to prevent work-related stress complaints, associations of psychosocial work exposures with suicidal ideation and the role of pets at work for enhanced workplace harmony. In other studies we explore challenges, experiences, and potential supports for East and Southeast Asian mothers in the workforce, gender inequalities of psychosomatic complaints at work and the role of resilience in mitigating job burnout's impact on workplace safety.*

**The overall fractions of coronary heart diseases and depression attributable to multiple dependent psychosocial work factors in Europe**

**Background:** The literature is nonexistent on the assessment of overall fractions of diseases attributable to multiple dependent psychosocial work factors. The objectives of the study were to calculate the overall fractions of coronary heart diseases (CHD) and depression attributable to multiple dependent psychosocial work factors in 35 European countries. **Methods:** We used already published fractions of CHD and depression attributable to each of the following psychosocial work factors: job strain, effort-reward imbalance, job insecurity, long working hours, and workplace bullying. We took all exposures and their correlations into account to calculate overall attributable fractions. Wald tests were performed to test differences in these overall attributable fractions between genders and between countries. **Results:** The overall fractions of CHD and depression attributable to all studied psychosocial work factors together were found to be 8.1% [95% CI: 2.0-13.9] and 26.3% [95% CI: 16.2-35.5] respectively in the 35 European countries. There was no difference between genders and between countries. **Conclusion:** Our study showed that the overall fractions attributable to all studied psychosocial work factors were substantial especially for depression. These overall attributable fractions may be particularly useful to evaluate the burden and costs attributable to psychosocial work factors, and also to inform policies makers at European level.

**Neidhammer et al. 2024.**

**International Archives of Occupational and Environmental Health, vol. 97, no. 5.**

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**Keywords:** Attributable fraction; cardiovascular diseases; effort-reward imbalance; job insecurity; job strain; long working hours; mental health; workplace bullying.

**Evidence Level:** 6B

**Link:** https://link.springer.com/article/10.1007/s00420-024-02067-x

**Effects of interventions implemented by occupational health professionals to prevent work-related stress complaints: A systematic review**

**Background:** Work-related stress complaints are a growing societal problem. Occupational health professionals often play a key role in its prevention. However, studies providing an overview of preventive interventions and their effectiveness are lacking. Therefore, the aim of this systematic review was to summarise the evidence on the effectiveness of interventions delivered by occupational health professionals to prevent work-related stress complaints. **Method:** A systematic search in PubMed, Embase, PsycInfo and Medline was performed in May 2023 based on PICO (population, intervention, control and outcomes) elements. Inclusion criteria were: peer-reviewed papers with a randomised controlled trial design, quasi-experimental design and pre-post evaluations with a control group; working populations not on sick leave; interventions delivered by occupational health professionals; and stress outcomes. Data were extracted using a predefined extraction form, risk of bias was assessed using the Cochrane risk of bias tool for randomised trials (RoB-2) and Risk of Bias in non-randomised Studies-of Interventions tool, and a narrative analysis was performed to summarise data. **Results:** Nine studies were included in this review and encompassed a diverse range of populations, interventions and professionals involved, outcome measures, and effects observed. Five studies found either mixed effects on stress outcomes, short-term positive effects, or positive effects in a subgroup of participants demonstrating high adherence to the intervention. **Conclusion:** As the results show mixed findings, a high risk of bias, and a limited number of studies was available, more research is needed to the effectiveness of the interventions and the factors underlying this.

**Orhan Pees et al. 2024.**
**Occupational Environmental Medicine, vol. 81, no. 6.**
**User License:** *Creative Commons - Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) (https://creativecommons.org/licenses/by-nc/4.0/)*
**Keywords:** Burnout; mental health; occupational health; occupational stress.
**Evidence Level:** 1A
**Link:** https://oem.bmj.com/content/81/6/321.long

**The associations of psychosocial work exposures with suicidal ideation in the national French SUMER study**

**Background:** The literature remains scarce on the work-related risk factors for suicide and suicidal ideation. The objectives were to explore the associations of psychosocial work exposures with suicidal ideation in a nationally representative sample of the working population. **Methods:** The study was based on the sample of 25,977 employees (14,682 men and 11,295 women) of the national French 2016-17 SUMER survey. The outcome was suicidal ideation assessed using the PHQ-9 instrument. Psychosocial work exposures included various factors from the job strain and effort-reward imbalance models, and other concepts. Statistical analyses were performed using weighted methods, including weighted logistic regression models. Other occupational exposures and covariates were considered. Gender differences were tested. **Results:** The prevalence of suicidal ideation was 3.5 % without any difference between genders. Psychosocial work exposures were found to be associated with suicidal ideation. The strongest association was observed between workplace bullying and suicidal ideation. Associations were also found between job strain model factors, job insecurity, low esteem, work-family conflict, ethical conflict, teleworking, and low meaning, and suicidal ideation. The associations were in general similar for men and women. Limitations: The study had a cross-sectional design and no causal interpretation could be done. A reporting bias and a healthy worker effect may be suspected. **Conclusion:** Psychosocial work exposures played a major role in suicidal ideation. More research may be needed to confirm our results, as suicidal ideation is an important warning signal for suicide prevention. More primary prevention towards the psychosocial work environment may be useful to reduce suicidal ideation at the workplace.

**Neidhammer et al. 2024.**
**Journal of Affective Disorder, vol. 356.**
**User License:** *Creative Commons Attribution -NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) (https://creativecommons.org/licenses/by-nc-nd/4.0/)*
**Keywords:** Job stress; mental disorders; occupational exposures; psychosocial work exposures; suicidal ideation; working conditions.

**Evidence Level:** 4B
**Link:** https://www.sciencedirect.com/science/article/pii/S0165032724006815?via%3Dihub

**Pets at work: Integrating pet-friendly initiatives into human resources for enhanced workplace harmony**
**Background:** The representation of companion animals, or pets, has been changing recently. Research concerning how pets influence employees' work-related well-being has also started to take its first steps. This research aimed to analyze (1) how managers perceive pet-friendly practices and their main effects at work, and (2) the impact of such practices on employees' well-being and work engagement. Relying on the social exchange perspective and the self-determination theory it was hypothesized that pet-friendly practices would positively influence employees' well-being and work engagement by satisfying their three basic needs (autonomy, competence, and relatedness). **Method:** Two studies with mixed methods were conducted. The first and exploratory study resorted to semi-structured interviews with six managers. The second was a two-wave study conducted with a large sample of workers (N = 379). **Results:** The first study highlighted the primary advantages and disadvantages of pet-friendly practices, along with the various obstacles and limitations, and proposed managerial strategies to overcome them. Managers generally expressed interest and enthusiasm about the topic but also pointed out challenges in implementing a pet-friendly strategy due to the limited number of empirical studies demonstrating its benefits. The second study's findings indicated that pet-friendly practices positively impacted employees' work engagement and well-being by fulfilling their needs for competence, autonomy, and relatedness. **Conclusion:** Overall, Portugal is seen as having a conservative culture, which slows the dissemination and implementation of these measures. To overcome these challenges, several managerial recommendations have been proposed. Raising awareness and fostering discussion on the topic are crucial steps toward integrating pet-friendly policies into human resources management.
**Junça-Silva et al. 2024.**
**BMC Psychology, vol. 12, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Basic psychological needs; pet-friendly practices; pets at work; well-being; work engagement.
**Evidence Level:** 5B
**Link:** https://bmcpsychology.biomedcentral.com/articles/10.1186/s40359-024-01854-y

**Challenges, experiences, and potential supports for East and Southeast Asian mothers in the workforce: A systematic review**
**Background:** To examine the challenges faced by Asian working mothers with a focus on re-entry to the workplace. In addition, we highlight potential supports that retain women in the workforce. **Methods:** A systematic review was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommendations and registered with PROSPERO database (CRD42022341130). Three independent reviewers were involved in the study selection to screen the search results sequentially by title, abstract, and full text using predefined inclusion and exclusion criteria. The methodological quality of each article was assessed via the Critical Appraisal Skills Programme (CASP) tool. **Results:** We analysed a total of 36 studies conducted across different regions: 30 from the East and 6 from Southeast Asia. Among these studies, 20 were quantitative in nature, 15 were qualitative, and one intervention. The 36 studies cover five themes: 1) policies, 2) external support sources, 3) external pressure, 4) breastfeeding and 5) health status. Within each theme the same factor can have a positive or negative impact on the mother depending on her having a pro-career or pro-family mindset. Companies can take various initiatives to support working mothers, such as providing facilities for expressing breast milk at the workplace, educating staff to promote breastfeeding and accommodate childcare needs, and extending maternity leaves. However, there is a lack of literature that directly addresses the barriers and concrete support available to working mothers in Asia, beyond the scope of breastfeeding. **Conclusions:** Our findings underscore several obstacles that can impede a woman's seamless return to work. Pro-family and pro-career mothers have differing needs that cannot be addressed at the same time. There is a lack of comprehensive understanding regarding effective strategies or interventions that can support a positive reintegration into the workforce.
**Ho et al. 2024.**
**BMC Womens Health, vol. 24, no. 1.**

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**Keywords:** Asia; re-entry; transition back to work; working mothers.
**Evidence Level:** 1A
**Link:** https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-024-03255-0

**Gender inequalities of psychosomatic complaints at work vary by occupational groups of white- and blue-collar and level of skill: A cross sectional study**

**Background:** Previous research has shown that women report more psychosomatic complaints at work than men. However, knowledge about gender inequalities in psychosomatic complaints within occupational groups and specific symptoms is lacking. This study aims to compare gender inequalities in psychosomatic complaints in the occupational groups of white-collar high-skilled, white-collar low-skilled, blue-collar high-skilled and blue-collar low-skilled workers. **Methods:** The study implemented a cross sectional design using data from the nationwide German Employment Survey of the Working Population on Qualification and Working Conditions conducted in 2017/ 2018. Psychosomatic complaints were operationalised by the following symptoms: headache, insomnia, tiredness, irritability, dejection, physical fatigue, and emotional fatigue. N = 20012 working German-speaking respondents were sampled. After excluding persons with missing data on the study variables, the sample consisted of N = 16359 persons. **Results:** Women reported significantly more psychosomatic complaints than men in the subgroups of white-collar high-skilled and white-collar low-skilled (ps < .05), inequalities in blue-collar high-skilled and blue-collar low-skilled only being numerical. Regarding specific symptoms, women reported more psychosomatic complaints then men in the subgroups of white-collar high-skilled workers, white-collar low-skilled workers, and blue-collar low-skilled workers. Headaches, physical fatigue, and emotional fatigue were the most common symptoms. The white-collar high-skilled subgroup had the highest number of symptoms with significant gender inequalities. These effects remained after controlling for age, working hours, parental status and marital status. **Conclusions:** Gender inequalities in psychosomatic complaints are ubiquitous but vary in their frequency by occupational subgroup and specific psychosomatic complaint. Women in white-collar high-skilled jobs in particular report to be burdened more often by many specific psychosomatic symptoms. Future studies should investigate the reasons for these occupational inequalities and develop interventions to reduce health inequalities in the workplace.

**Grasshoff et al. 2024.**
**PLoS One, vol. 19, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Gender inequalities; complaints; work; occupational groups.
**Evidence Level:** 4B
**Link:** https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0303811

**The role of resilience as a key player in mitigating job burnout's impact on workplace safety**

**Background:** It is probable that resilience can play a significant role in mitigating the impact of job burnout on workplace safety outcomes. Identification of these relations and paths can be useful for reducing burnout effects and reinforcing safety behavior factors. This study seeks to explore the relationship between job burnout and unsafe behavior, with a specific focus on the mediating role of resilience. **Method:** This cross-sectional study, conducted in 2023, involved 200 workers in the spinning and weaving industries in central Iran. The study used printed questionnaires distributed to study participants during their rest periods to collect data for further analysis. The questionnaires included demographic information, the Maslach burnout inventory, the Connor-Davidson Resilience Scale, and a set of safety behavior questionnaires. Subsequently, the study analyzed various dimensions of job burnout with respect to unsafety behavior by constructing a theoretical model using AMOS software. **Results**: The results indicate that three burnout dimensions indirectly influence safety compliance through resilience (P < 0.001). Specifically, depersonalization and personal accomplishment directly and indirectly affect safety participation through resilience and safety compliance (P < 0.001). Resilience had the highest direct and total effect coefficients on safety compliance (0.692 and 0.692), while emotional exhaustion exhibited the highest indirect coefficients (- 0.505). Regarding safety participation, the highest direct coefficient was associated with personal accomplishment (0.406), and the greatest indirect and total coefficients with

depersonalization (- 0.370 and - 0.588). **Conclusion:** By recognizing the differential impacts of various burnout dimensions, tailored interventions can be developed to address specific facets of burnout, thus optimizing safety initiatives. Moreover, the pivotal role of resilience unveils a promising avenue for mitigating the adverse effects of burnout on unsafe behaviors.
**Azimi et al. 2024.**
**Scientific Reports, vol. 14, no. 1.**
**User License:** *Creative Commons Attribution -NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0) (https://creativecommons.org/licenses/by-nc-nd/4.0/*
**Keywords:** Job burnout; resilience; safety compliance; safety participation; unsafe behavior.
**Evidence Level:** 4B
**Link:** https://www.nature.com/articles/s41598-024-68042-1

## Fostering Work Participation

### Return to Work

*This month we explore return to work issues associated with sick leave due to musculoskeletal and common mental disorders, post-traumatic spine fractures and post primary total hip arthroplasty.*

**Systematic review and tools appraisal of prognostic factors of return to work in workers on sick leave due to musculoskeletal and common mental disorders**
**Background and Method:** With the overall objective of providing implication for clinical and research practices regarding the identification and measurement of modifiable predicting factors for return to work (RTW) in people with musculoskeletal disorders (MSDs) and common mental disorders (CMDs), this study 1) systematically examined and synthetized the research evidence available in the literature on the topic, and 2) critically evaluated the tools used to measure each identified factor. A systematic search of prognostic studies was conducted, considering four groups of keywords: 1) population (i.e., MSDs or CMDs), 2) study design (prospective), 3) modifiable factors, 4) outcomes of interest (i.e., RTW). Studies showing high risk of bias were eliminated. Tools used to measure prognostic factors were assessed using psychometric and usability criteria. **Results:** From the 78 studies that met inclusion criteria, 19 (for MSDs) and 5 (for CMDs) factors reaching moderate or strong evidence were extracted. These factors included work accommodations, RTW expectations, job demands (physical), job demands (psychological), job strain, work ability, RTW self-efficacy, expectations of recovery, locus of control, referred pain (back pain), activities as assessed with disability questionnaires, pain catastrophizing, coping strategies, fears, illness behaviours, mental vitality, a positive health change, sleep quality, and participation. Measurement tools ranged from single-item tools to multi-item standardized questionnaires or subscales. The former generally showed low psychometric properties but excellent usability, whereas the later showed good to excellent psychometric properties and variable usability. **Conclusion:** The rigorous approach to the selection of eligible studies allowed the identification of a relatively small set of prognostic factors, but with a higher level of certainty. For each factor, the present tool assessment allows an informed choice to balance psychometric and usability criteria.
**Villotti et al. 2024.**
**PLoS One, vol. 19, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Return to work; sick leave; musculoskeletal disorders; mental disorders.
**Evidence Level:** 1A
**Link:** https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0307284

**Returning to work after traumatic spine fractures: current status in a military hospital**
**Background:** The consequences of traumatic spine fracture (TSF) are complex and have a major burden on patients' social life and financial status. In this study, we aimed to investigate the return to work (RTW) after surgically treated TSFs, develop eventual predictors of delayed or failure to RTW, and assess narcotics use following such injuries. **Methods:** This was a single-center retrospective cohort study that was

performed in a tertiary care center. TSF patients who required surgical intervention from 2016 to 2021 were enrolled. Demographic, operative, and complication data, as well as narcotics use, were recorded. RTW was modeled using multivariate logistic regression analysis. **Results:** Within the 173 patients with TSF, male patients accounted for 82.7%, and motor vehicle accidents were the most common mechanism of injury (80.2%). Neurologically intact patients represented 59%. Only 38.15% returned to work after their injury. Majority of the patients didn't use narcotics more than 1 week after discharge (93.1%). High surgical blood loss, operation time, and hospital length of stay were significantly associated with not returning to work. In multivariant regression analysis, every increase of 100 ml of surgical blood loss was found to decrease the chance of RTW by 25% (P = 0.04). Furthermore, every increase of one hour in operation time decreases the chance of RTW by 31% (P = 0.03). **Conclusion:** RTW is an important aspect that needs to be taken into consideration by health care providers. We found that age and high surgery time, blood loss, and hospital stay are significantly impacting patients' RTW after operated TSF.
**Alhabeeb et al. 2024.**
**Military Medicine, vol. 189, no. 7-8.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Return to work; traumatic spine fractures; military hospital.
**Evidence Level:** 4B
**Link:** https://academic.oup.com/milmed/article/189/7-8/e1690/7606447?login=false

**Early functional recovery outcomes and return to work after primary total hip arthroplasty: A novel patient reported outcomes questionnaire**
**Background:** Clinical and patient reported outcomes are often collected before and after the procedure to benchmark and study outcomes for patients. These outcomes and scores are useful for tracking patient outcomes after surgery, however, the fact that these commonly used measures typically provide information about a patient's level of pain and function at a single point in time is a limitation.
**Methods:** We present early functional recovery and return to work outcomes after primary THA from a novel questionnaire administered in a global, multi-center, prospective clinical study. **Results:** By 6 and 12 weeks post-op, a large proportion of study subjects were able to perform functional recovery outcomes after their THA: walk without an aid (74%; 94%); drive (76%; 97%); basic activities of daily living (94%; 99%); perform light household duties (91%; 96%); perform moderate-to-heavy household duties (54%; 86%); go up and down a flight of stairs (92%; 99%); put on socks/stockings (77%; 93%); bend down to pick up an object from the floor (87%; 97%); stand up from a chair (96%; 99%); perform leisure recreational activities (54%; 84%); perform primary goal identified pre-THA (69%; 86%). 60% were able to return to work by 12 weeks post-op. These questions showed strong association with the Forgotten Joint Score.
**Conclusion:** Excellent patient reported early functional recovery outcomes and satisfaction were observed at 6- and 12-weeks post-op in this cohort and is the first reported data using a novel PRO.
**Fawley et al. 2024.**
**Journal of Orthopaedic Surgery and Research, vol. 19, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Early recovery; functional recovery outcomes; patient reported outcomes; return to work; total hip arthroplasty.
**Evidence Level:** 2A
**Link:** https://josr-online.biomedcentral.com/articles/10.1186/s13018-024-04937-z

## Working hours

**How does working time impact perceived mental disorders? New insights into the U-shaped relationship**
**Background and Method:** Based on a large-scale nationally representative survey in China, this paper uses the exogenous impact of automation on working hours as the instrumental variable to examine working time's impact on perceived mental disorders, on the basis of dealing with endogeneity. **Results:** Different from existing literature, it is found that the impact of working time on perceived mental disorders is U-shaped, rather than linear. Mental disorders firstly decrease with working hours. After working more than 48.688 h per week, further increases in working time carry notable mental health costs, leading to a positive relationship between working hours and depression. The turning point of this U-shaped

relationship is almost in line with the International Labor Organization's 48 working hours/week standard, justifying it from a mental health perspective. In addition, we further exclude the possibility of more complex nonlinear relationships between working time and perceived mental disorders. Furthermore, heterogeneities are found in the effects of working hours on mental disorders across different subgroups. Males are more depressed when working overtime. Older workers have a lower tolerance for overwork stress. The turning point is smaller for the highly educated group and they are more sensitive to working longer. Those with higher socioeconomic status are less depressed after exceeding the optimal hours of work. The increase in depression among rural workers faced with overwork is not prominent. Perceived mental disorders are lower among immigrants and those with higher health status. In addition, labor protection and social security help to weaken mental disorders caused by overtime work. **Conclusion:** In conclusion, this paper demonstrates that working time has a U-shaped impact on perceived mental disorders and highlights the vulnerability of certain groups, providing a reference for setting optimal working hours from a mental health perspective.

**Niu et al. 2024.**

**Frontiers in Public Health, vol 12.**

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**Keywords:** U-shaped relationship; depression; instrumental variable approach; perceived mental disorders; working time.

**Evidence Level:** 4B

**Link:** https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1402428/full

## Wellness Programs

*This month we explore issues associated with the Total Worker Health® (TWH) program, and the potentials of digital workplace health promotion.*

**The Total Worker Health® (TWH) approach: A systematic review of its application in different occupational settings**

**Background:** The National Institute for Occupational Safety and Health (NIOSH), in 2011, developed the "Total Worker Health®" (TWH) as a holistic approach to protect and promote the workers' safety, health, and well-being. After over ten years from the TWH development, the aim of the present systematic review is to provide a comprehensive overview of the worldwide TWH initiatives. **Methods:** PubMed, Scopus and ISI Web of Science were searched for TWH studies published up to the 31st of July 2023, and 43 investigations could be included. The review was registered on the International prospective register of systematic reviews PROSPERO with the reference number CRD42023416972. **Results:** Issues that emerged as relevant for the TWH operationalization were the awareness about the TWH approach and fundamentals, the leadership commitment, and a participatory engagement of the workforce: these aspects all contributed to acceptable and effective setting oriented TWH plans, specifically tailored on the peculiarities of the workplace, including small enterprises and multiemployer worksites. Evaluation and continual improvement were reported as fundamental for the successful implementation of TWH initiatives. Limited resources for safety and health initiatives, in terms of time, people, and funds, together with difficulties in the identification of safety and health priorities and a poor participatory culture were recognized as obstacles to the TWH application. Training resulted the core component of the TWH leadership and workforce preparedness, with beneficial results in terms of safety culture and adoption of preventive measures. **Conclusions:** Although interesting aspects emerged from our review, future longitudinal investigations should confirm the effectiveness, easy integration, and long-term sustainability of TWH models in different workplaces, in order to effectively support safe and health-enhancing works able to improve innovation and productivity.

**Leso et al. 2024.**

**BMC Public Health, vol 24, no. 1.**

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**Keywords:** Health promotion; hierarchy of controls; integrated programs; leadership commitment; occupational health; occupational risk management; occupational safety and health; participatory approach; workers well-being; workplace policies and programs.
**Evidence Level:** 1A
**Link:** https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-19500-y

**The potentials of digital workplace health promotion**
**Background:** Workplace Health Promotion (WHP) can sustainably impact organizations by improving employee health and strengthening legitimization. Digital Workplace Health Promotion (DWHP) may have even more impact thanks to its scope. This study reports on a hospital in Austria wherein DWPH was introduced into the existing WHP structure in combination with a digitalization effort for the entire organization. **Method:** The approach was mainly quantitative with a few open questions and included a survey before and an evaluation after the project with about 240 respondents each. The use, intentions, barriers and benefits of DWHP from the employees' perspectives were reported on to evaluate the potentials of DWHP for furthering sustainable developments within organizations. **Results and Conclusion**: While DHWP is perceived as positive, current use is low. Nevertheless, intended future use is promising and perceived benefits are higher after implementation. However, perceived barriers are still high, requiring organizational efforts.
**Nöhammer et al. 2024.**
**International Journal of Environmental Research and Public Health, vol. 21, no. 7.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Digital Workplace Health Promotion; barriers; benefits; employees; healthcare; hospital; impact.
**Evidence Level:** 5B
**Link:** https://www.mdpi.com/1660-4601/21/7/902

## Organisational Issues

**Assessing the impact of authorisation process as a regulatory tool in the European REACH regulation: A study on improving occupational safety for applying companies**
**Background and Method:** This study looks into the effectiveness of the authorisation procedure as a regulatory instrument within the framework of the European REACH regulation. It highlights its impact on enhancing occupational safety and health for both applicants and companies utilising the substances. This procedure encompasses manufacturers, importers, and downstream users of substances, as well as representatives of foreign manufacturers who are also eligible to seek authorisation. When applying for authorisation, the ECHA Risk Assessment Committee (RAC) assesses the risks associated with the intended uses of the substance, including the appropriateness and effectiveness of the Occupational Conditions (OCs) and Risk Management Measures (RMMs) described in the application and the risks posed by potential alternatives. If the RAC determines that the OCs/RMMs are inadequate for managing or controlling the risk, or if the measures to protect workers are deemed insufficient, it may recommend additional measures to enhance occupational safety and health or environmental protection. The 398 processed Applications for Authorisation (AfA) that have been submitted to date were examined to determine these recommended measures, categorised as Conditions for use, Monitoring arrangements, and Recommendations for Review Reports. **Results and Conclusion:** Overall, a significant improvement concerning occupational safety and health seems necessary, as indicated by the large number of measures recommended by the ECHA Committee for Risk Assessment (RAC) and ECHA Committee for Socio-economic Analysis (SEAC) or supplemented by the European Commission. In addition to the proposed measures, a short assessment provided by the committees as to whether the operational conditions and risk management measures are adequate in controlling the risks is also included in the study.
**Deubner et al. 2024.**
**Annals of Work Exposures and Health, vol. 68, no. 8.**
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**Keywords:** AfA; RAC; REACH; SEAC; SVHC; application for authorisation; authorisation; occupational safety and health; risk assessment; risk management; worker.
**Evidence Level:** 5B
**Link:** https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11229307/

## Job Design

*This month we explore job design issues associated with working from home and teleworking*

**The impacts of working from home on individual health and well-being**
**Background:** Using a novel German linked employer-employee dataset, we provide unique evidence about the consequences of working from home (WfH) on individual health and well-being. During the recent pandemic, this locational flexibility measure has been used extensively to promote health by hampering the spread of the virus and to secure jobs. However, its direct theoretical ambiguous effects on health and well-being as characterized by different potential channels have barely been empirically investigated to date despite WfH's increasing popularity in the years before the pandemic. **Method:** To address concerns about selection into WfH in our dataset that is unaffected by the COVID-19 shock, our analysis relies on an identification strategy ruling out confounding effects by time-invariant unobservable variables. Moreover, we explain the remaining (intertemporal) variation in the individual WfH status by means of an instrumental variable strategy using variation in equipment with mobile devices among establishments. **Results:** We find that subjective measures of individual health are partly affected by WfH, whereas no corresponding effect is present for an objective measure of individual health. In terms of individual well-being, we find that WfH leads to considerable improvement. **Conclusion:** By addressing the potential heterogeneity in our effect of interest, we find that men and middle-aged individuals particularly benefit from WfH.
**Denzer et al. 2024.**
**European Journal of Health Economics, vol. 25, no. 5.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Health; well-being; working from home.
**Evidence Level:** 5B
**Link:** https://link.springer.com/article/10.1007/s10198-023-01620-8

**Teleworking: does it make workers healthier and productive? A cross-sectional study on a Southern European population**
**Background:** Teleworking (TW) has recently shifted from a marginal into a common practice. Yet, concerns have been raised regarding potential work-health negative effects, related to the reduced socialization, and extended working hours with computers at home, possibly offset by reduced commuting time or better individual work-life balance. This paper aims at describing the influence of TW on health, well-being, and productivity perceptions, and how this is shaped by TW conditions. **Methods:** We collected data from workers of 25 companies that exert their activity in Portugal. Data were completed with a representative sample of workers who regularly participate in surveys (total N = 1,069). We applied an on-line questionnaire from September the 1st 2022 to December the 1st 2022. We performed a simple descriptive analysis of each variable. Then, we analyzed the relationship between TW conditions and self-reported health, and between TW conditions at home and productivity, using logistic regression models. **Results:** We observed a high prevalence of self-perceived health worsening (15.9%), mostly among those with poor TW conditions. Most teleworkers enjoyed favorable TW conditions, despite limited company support. Relevant changes were observed in lifestyle factors, towards more smoking (5.5%), alcohol drinking (4.5%), and worse diet (10.1%). Two thirds reported enhanced productivity. A statistically significant relationship was observed between inadequate TW conditions, health deterioration, and lower productivity. A 6.0% point (pp) increased risk of productivity worsening was observed when employees faced at least one inadequate condition at home (no private working place at home, inadequate heating, artificial light, or absence of well-being at home). The risk of health deterioration increased by 12.9 pp when facing at least one of these inadequate conditions, and by 6.3 under hybrid TW, compared to one or two days of TW.
**Conclusions:** Most teleworkers highlighted a positive perspective about teleworking. Yet, TW conditions are

not favorable for all workers, with consequences on health, well-being, and productivity, suggesting that further support is needed for teleworkers to protect their health at home, and reach its maximum benefit.
**Perelman et al. 2024.**
**BMC Public Health, vol. 24, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Health; Portugal; productivity; telework; well-being.
**Evidence Level:** 4B
**Link:** https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-19481-y

## Shift Work

*This month we explore issues associated with shift work and key health behaviors, combined exposure to chemicals and unusual working hours, association between shift work sleep disorders and premature ejaculation and work-related fatigue, and the relationship between shift work schedule and blood and metabolic parameters.*

**More than sleep problems? Testing five key health behaviors as reasons for quality of life issues among shift workers**

**Background:** The shift work schedule is a common work arrangement that can disrupt typical sleep-wake rhythms and lead to negative health consequences. The present study aims to examine the effect of shift work on health-related quality of life (QoL) and explore potential behaviorial mediators (i.e., sleep, eating, exercise, smoking, drinking). **Methods:** A cross-sectional survey was conducted among 4,449 petroleum workers in southwest China. Data on shift work status, health behaviors, and physical and mental health QoL were collected. We tested our model using path analysis and the Monte Carlo approach among 2,129 included participants. **Results:** After adjusting for covariates, shift work did not exhibit a significant direct association with QoL. However, shift work indirectly related to poorer physical health quality of life via less frequent healthy food consumption; shift work also indirectly related to poorer mental health QoL via both less frequent healthy food consumption and physical exercise. No significant indirect effects were found via sleeping, smoking, or drinking. **Conclusions:** Results suggest that shift work presents a challenge for QoL among Chinese petroleum workers due to their lesser engagement in two specific health behaviors: healthy eating and physical exercise. Healthy eating and exercise may present an even more prominent threat to shift workers' QoL than sleep and substance use. Strategies targeting shift work schedule as well as eating and exercise behaviors may help protect against poor QoL and adverse physical and mental health outcomes in this vulnerable group.
**Chen et al. 2024.**
**Health and Quality of Life Outcomes, vol. 22, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Health behaviors; quality of life; shift work.
**Evidence Level:** 4B
**Link**: https://hqlo.biomedcentral.com/articles/10.1186/s12955-024-02269-4

**Effects of the combined exposure to chemicals and unusual working hours**

**Background:** Both exposure to occupational chemicals and to unusual working hours have well documented effects on health. Determination of occupational exposure limits is, however, usually based on chemical-only exposure and assumes an 8-h workday, 5 days/week and a 40-h work week. A significant proportion of the workforce is exposed to chemicals while working in other work schedules. This review thus aimed to synthesize and evaluate the scientific support for a combined effect of unusual working hours and chemical exposure and, if possible, give recommendations for OEL adjustments to account for unusual working hours. **Methods:** The search for articles was made as part of the preparation of a report for the Nordic Expert Group for Criteria Documentation of Health Risks from Chemicals. In this report, unusual working hours were categorized as shift work or extended (>8 h) working hours. Inclusion criteria were observational studies in the English language published up to November 2021 in peer-reviewed journals, with explicit metrics of exposure (chemicals and unusual working hours) and of health outcome, and which explicitly tested the association between exposure and outcome. Search engines of seven

databases were used. **Results:** Of the initially 15 400 identified papers, 9 studies published between 1985 and 2021 met the inclusion criteria, 7 of which showed significant associations. Results from a few of the studies, i.e. regarding effects of dust and endotoxin on lung function, effects of acetone on sleep quality and tiredness, effects of carbon disulphide on coronary artery disease and effects of chemicals on spontaneous abortion, suggested more pronounced effects during night shifts compared to during day shifts. **Discussion:** The reviewed data is considered insufficient to conclude on recommendations for OEL adjustment for shift work. Suggested areas of future studies are mentioned. **Conclusion:** Further studies about the effects of the combined exposure to unusual working hours and chemical exposure are essential for risk assessment, and for recommendation of potential OEL adjustments. What is important about this paper? Effects of chemical agents at the workplace may depend not only on exposure level and duration but also on the time of exposure in relation to the circadian rhythm. This study reviewed the scientific support for a combined effect of unusual working hours and chemical exposure and revealed an obvious need for additional studies regarding the complex interplay of the two different exposures with respect to adverse health effects.

**Lie et al. 2024.**

**Annals of Work Exposures and Health, vol. 68, no. 8.**

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**Keywords:** Coronary artery disease; lung function; night work; shift work; spontaneous abortion; tiredness; working time.

**Evidence Level:** 6A

**Link:** https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11229379/

**The association between shift work, shift work sleep disorders and premature ejaculation in male workers**

**Background:** Shift work and Shift Work Sleep Disorder (SWSD) are known to affect the secretion of several neurotransmitters and hormones associated with premature ejaculation (PE). However, their specific influence on the regulation of male ejaculation remains unclear. This study explores the relationship between shift work, SWSD, and PE. **Methods:** From April to October 2023, a cross-sectional survey was conducted across five regions of China to explore the work schedules, sleep quality, and sexual function of male workers. Participants' sleep quality was evaluated using a validated SWSD questionnaire, and their erectile function and ejaculatory control were assessed with the International Inventory of Erectile Function (IIEF-5) scores and Premature Ejaculation Diagnostic Tool (PEDT) scores, respectively. Univariate and multivariate linear regression analyses were employed to identify risk factors associated with PE. Confounders were controlled using multiple regression models, and clinical prediction models were developed to predict PE onset and assess the contribution of risk factors. **Results:** The study included 1239 eligible participants, comprising 840 non-shift workers and 399 shift workers (148 with SWSD and 251 without SWSD). Compared to non-shift working males, those involved in shift work (β 1.58, 95% CI 0.75 - 2.42, $p < 0.001$) and those suffering from SWSD (β 2.86, 95% CI 1.86 - 3.85, $p < 0.001$) they had significantly higher PEDT scores. Additionally, we identified daily sleep of less than six hours, depression, anxiety, diabetes, hyperlipidemia, frequent alcohol consumption (more than twice a week), and erectile dysfunction as risk factors for PE. The predictive model for PE demonstrated commendable efficacy. **Conclusion:** Both shift work and SWSD significantly increase the risk of premature ejaculation, with the risk magnifying in tandem with the duration of shift work. This study reveals the potential impact of shift work and SWSD on PE and provides new theoretical foundations for the risk assessment and prevention of this condition.

**Zheng**

**BMC Public Health, vol. 24, no. 1.**

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**Keywords:** Predictive model; premature ejaculation; risk factors; shift work; shift work sleep disorder.

**Evidence Level:** 4B

**Link:** https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-19141-1

**Investigating the relationship between shift work schedule and blood and metabolic parameters: A 10-years retrospective cohort study**

**Background:** Shift work has become increasingly common in modern society. Shift work has been associated with a range of negative health outcomes. **Method:** Therefore, this 10-years retrospective cohort study, aimed to investigate the relationship between shift work and blood and metabolic parameters. This retrospective cohort study was conducted in a metal parts manufacturing industry in 2023. In this study, 204 shift workers and 204 day workers were examined. All the studied blood and metabolic parameters were collected by reviewing the medical records of all participants during a 10-years period (2013-2022). Moreover, the amounts of physical, chemical, and ergonomics harmful agents in the work environment were investigated. All the collected data were analyzed using SPSS version 25.0. **Results:** The values of Body Mass Index (BMI), Red Blood Cell Count (RBC), Platelets Count (PLT), Thyroid-Stimulating Hormone Level (TSH), Fasting Blood Sugar Level (FBS), Creatinine, Triglyceride (TG), Liver Enzymes level (SGOT and SGPT), and Systolic Blood Pressure (SBP) were higher among the shift work employees, and a significant difference was observed between the values of these parameters between the two groups. The results of logistic regression showed that the highest effect of shift work was observed on the parameters of FBS, TG, SGPT, TSH, Physical activity, BMI, Sleep duration, PLT, and Sleep quality with beta coefficient values of 0.49, 0.33, 0.29, 0.29, 0.20, 0.18, 0.14, 0.13 and, 0.11, respectively (p-value < 0.01). **Conclusion:** The present study contributes to a growing body of evidence that blood and metabolic factors are likely to be influenced by shift work. These findings have important implications for policy makers, highlighting the need for interventions to mitigate the negative health effects of shift work on workers.

**Soltanzadeh et al. 2024.**
**Scientific Reports, vol. 14, no. 1.**
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**Keywords:** Blood parameters; metabolic parameters; retrospective cohort study; shift work.
**Evidence Level:** 4B
**Link:** https://www.nature.com/articles/s41598-024-68378-8

**Effects of a work schedule with abated quick returns on insomnia, sleepiness, and work-related fatigue: Results from a large-scale cluster randomized controlled trial**

**Background:** To investigate the effect of a work schedule with abated quick returns (i.e. > 11 hours between two shifts) on insomnia, daytime sleepiness, and work-related fatigue compared to a shift schedule maintaining the usual number of quick returns. **Methods:** A two-armed cluster randomized controlled trial including 66 units was conducted at a university hospital in Norway. Units with healthcare workers on rotating shift schedules were randomly assigned to a shift schedule with abated quick returns (intervention) or to continue with a schedule including quick returns as usual (control) for 6 months. Questionnaires assessed symptoms of insomnia (Bergen Insomnia Scale [BIS]), daytime sleepiness (Epworth Sleepiness Scale [ESS]), and work-related fatigue (Revised Swedish Occupational Fatigue Inventory) at baseline and towards the end of the intervention. Data were analyzed using multilevel linear mixed-effects models, and Cohen's d was used to calculate the effect size between groups. **Results:** Overall, 1314 healthcare workers (85.2% female) completed the baseline questionnaire (response rate 49.1%), and 552 completed the follow-up questionnaire. The intervention reduced quick returns from an average of 13.2 (SD = 8.7) to 6.7 (SD = 6.0), while the control group's average remained relatively unchanged from 13.2 (SD = 8.7) to 12.0 (SD = 9.3). Results showed a small improvement in symptoms of insomnia (BIS; d = -0.13, p = .022) and daytime sleepiness (ESS; d = -0.14, p = .013) in favor of the intervention. No effects were observed on work-related fatigue. **Conclusions:** Reducing the number of quick returns in the work schedule resulted in improvements in insomnia and daytime sleepiness. The findings highlight the importance of sufficient daily rest time in the work schedule of healthcare workers. **Clinical trial:** Health Promoting Work Schedules: The Effect of Abolishing Quick Returns (HeWoS); clinicaltrials.gov/ct2/show/NCT04693182; Registered at ClinicalTrials.gov with the identifier NCT04693182.

**Djupedal et al. 2024.**
**Sleep, vol. 47, no. 7.**
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**Keywords:** Daily rest periods; daytime sleepiness; fatigue; healthcare workers; insomnia; insufficient sleep; quick returns; shift work.
**Evidence Level:** 2B
**Link:** https://academic.oup.com/sleep/article/47/7/zsae086/7641764?login=false

**The influence of night shift work and associated factors on serum uric acid in aircraft maintenance workers**

**Background:** The prevalence of 12-hour shift work is increasing in various occupations. Shift work has been linked to circadian rhythm disruption, which may lead to hormonal changes and metabolic disorders, including alterations in glucose, lipid, and purine metabolism. Despite this, there is limited research on the potential connection between work shifts and abnormal serum uric acid (SUA) levels. Furthermore, the factors that contribute to abnormal SUA levels in shift workers are not well-understood. Therefore, this study aimed to analyze the SUA levels of shift workers employed in an aircraft maintenance company, investigate the potential association between shift work and SUA levels, and explore the factors that may influence abnormal SUA levels in shift workers. **Methods:** A total of 2263 male workers from an aircraft maintenance company were included in this study using the cluster sampling method. The workers were divided into two groups based on their working shifts: night shift (N = 1047, 46.27%) and day working (N = 1216, 53.73%). A survey was conducted between April 1st and June 30th, 2022 to gather information on work, lifestyle, physical examination results, and other relevant factors. The survey included a self-designed demographic information questionnaire to collect data on workers' characteristics, medical history, years of employment, smoking and drinking habits, and main lifestyle behaviors. The workers' SUA levels were measured using uricase colorimetry. One-way ANOVA was used to compare the difference in the abnormal detection rate of SUA between the two groups, and multi-factor logistic regression analysis was used to identify the factors that influence abnormal SUA levels. **Results:** The study indicated that 48.9% of night shift workers and 43.8% in the regular day workers had abnormal SUA levels, with a significant difference between the two groups ($\chi^2 = 6.125$, $P = 0.013$). Factors such as circadian rhythm type, shift work, age, the taste of diet, type of diet, smoking, overweight or obesity based on body mass index (BMI), concentration of urine creatinine (CREA), total cholesterol, triglyceride, and low-density lipoprotein cholesterol were found to be correlated with SUA abnormalities ($P < 0.05$). The risk of developing SUA abnormalities was found to be higher in individuals with an intermittent (OR = 1.34, 95% CI: 0.83-2.12, $P < 0.05$) or evening circadian rhythm type (OR = 1.45, 95% CI: 0.86-2.43, $P > 0.05$) compared to those with a morning type. Additionally, factors such as night shift work, a high-sodium diet, smoking, a diet high in meat and low in vegetables, being overweight or obese, and higher levels of CREA were also found to increase the risk of developing SUA abnormalities. The study also revealed a significant dose-response relationship between BMI and abnormal uric acid levels. After controlling for other factors, the risk of developing SUA abnormalities was found to be 1.18 times higher in the night shift work group than in the day work group (OR = 1.18, 95% CI:1.02-1.34, P = 0.01). **Conclusion:** Shift work has been linked to a higher risk of developing SUA abnormalities, and there are several factors that may contribute to this risk. To prevent diseases, it is recommended that enterprises implement better health monitoring and management practices for shift workers.

**Dong et al. 2024.**
**BMC Public Health, vol. 24, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/*
**Keywords:** Influencing factors; serum uric acid; shift work.
**Evidence Level:** 3B
**Link:** https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-18849-4

## Work Ability

*This month we explore work ability issues associated with people with multiple sclerosis and patients post-Covid-19*

**Exploring the workplace factors and their influence on the employment outcomes for people with multiple sclerosis**

**Background:** High unemployment rate of people with multiple sclerosis (PwMS) is associated with substantial economic costs. Whilst the impact of MS symptoms and other disease-related factors on employment outcomes of PwMS has been assessed, limited evidence exists on the impacts of workplace factors. Objective: To investigate the most common individual and group workplace factors associated with unemployment or a perceived risk of unemployment in PwMS, and to identify patient subgroups that are more susceptible to changes in employment status due to such factors. **Methods:** Data from the Australian MS Longitudinal Study (AMSLS) on employment status and workplace factors were used. Fifteen workplace factors were classified under four groups: organisational, commuting, moving around at work, and equipment usage factors. Participants answered 'Yes' to each factor if it related to their unemployment and/or perceived risk of becoming unemployed and a group factor was considered "Yes" if at least one individual factor within it was answered as "Yes". The proportions of "Yes" responses were calculated for both individual and group factors. Total number of individual factors was calculated and descriptive analyses and ordered logistic regression were used to summarize the total number of factors affecting each participant, and their association with participants' occupations, sex, disability severity and disease duration. **Results:** Common workplace factors influencing employment were organisational (39.8 % perceived risk, 44.0 % lost employment), commuting (28.9 % perceived risk) and equipment usage difficulty (30.9 % lost employment). Common individual factors included inflexible working conditions, lack of suitable work, commuting difficulties, architectural barriers, and requirement to stand for long periods to use equipment. Professionals, blue-collar workers, and those with moderate/severe disability were more likely to report a higher number of workplace factors risking their employment. **Conclusions:** Workplace factors undermine PwMS employment, with variations among subgroups based on occupation and disability severity. Understanding these barriers is crucial for supporting PwMS in the workforce.

**Zhao et al. 2024.**

**Multiple Sclerosis and Related Disorders, vol. 88.**

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**Keywords:** Employment status; Multiple sclerosis; risk of leaving employment; unemployment; workplace factors.

**Evidence Level:** 4A

**Link:** https://www.msard-journal.com/article/S2211-0348(24)00331-6/fulltext

**Work ability and return-to-work of patients with post-COVID-19: A systematic review and meta-analysis**

**Background:** In addition to several sequelae of post-COVID-19, individuals also experience significant limitations in work ability, resulting in negative consequences for the return-to-work (RTW) process. This systematic review and meta-analysis were conducted to assess the impact of post-COVID-19 on work ability and RTW of individuals previously infected with SARS-CoV-2. **Methods:** Studies on the work ability and RTW of patients with post-COVID-19 (more than 12 weeks after an acute SARS-CoV-2 infection) were regarded eligible for inclusion. Systematic search of literature was performed up to March 2023 using five databases (MEDLINE, EMBASE, CINAHL, CENTRAL and WHO COVID 19). Study selection followed the Preferred Reporting Items for Systematic Review and Meta-analysis (PRISMA) Statement. A meta-analysis estimated the overall success rate of RTW. The risk of bias of the included studies was evaluated with the Newcastle Ottawa Scale (NOS). **Results:** 19 relevant studies, published between 2021 and 2023, were included in the systematic review, involving 21.155 patients from 14 different countries. The findings indicate that a significant proportion of individuals with post-COVID-19 experience persistent symptoms and functional impairments, with fatigue being the most prominent symptom. These persistent symptoms can have a considerable (negative) impact on individuals' physical and psychological capacity to participate in work-related activities, leading to lower work ability and increased absenteeism. The RTW for post-COVID-19 patients is complex, with approximately 60.9% of patients successfully returning to work after 12 or more

weeks following SARS-CoV-2 infection. Among those who successfully returning to work, a considerable number need modifications in their work duties or hours to cope with residual impairments. Factors such as workplace accommodations, supportive policies, and occupational rehabilitation programs play a crucial role in facilitating successful RTW. **Conclusions:** The systematic review underscores the substantial impact of post-COVID-19 on work-related outcomes. The implications of this research highlight the need for healthcare providers, employers, and policymakers to collaborate in creating inclusive work environments and implementing tailored rehabilitation programs to support individuals recovering from post-COVID-19. Further research should focus on long-term follow-up studies with mixed methods to gain a more comprehensive understanding of the long-term consequences of post-COVID-19 on work ability and RTW outcomes. **Prospero registration number:** CRD42023385436.
**Ottiger et al. 2024.**
**BMC Public Health, vol. 24, no. 1.**
**User License:** *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
**Keywords:** Occupational status; post-COVID-19; return-to-work; sick leave; work ability.
**Evidence Level:** 1A
**Link:** https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-19328-6

## Adapting to the Future of Work

### Work Environment

**Employee innovation during office work, work from home and hybrid work**
**Background:** The Covid-19 pandemic forced firms globally to shift workforces to working from home [WFH]. Firms are now struggling to implement a return to working from the office [WFO], as employees enjoy the significant benefits of WFH for their work-life balance. Therefore many firms are adopting a hybrid model in which employees work partly from the office and partly from home. **Method:** We use unique and detailed data from an Indian IT services firm which contains a precise measure of innovation activity of over 48,000 employees in these three work environments. Our key outcomes are the quantity and quality of ideas submitted by employees. **Results**: Based on an event study design, the quantity of ideas did not change during the WFH period as compared to WFO, but the quality of ideas suffered. During the later hybrid period, the quantity of submitted ideas fell. In the hybrid phase innovation suffered particularly in teams which were not well coordinated in terms of when they worked at the office or from home. **Conclusion:** Our findings suggest that remote and hybrid work modes may inhibit collaboration and innovation.
**Gibbs et al. 2024.**
**Scientific Reports, vol. 14, no. 1.**
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**Keywords:** Collaboration; coordination; hybrid work; innovation; telecommuting; working from home.
**Evidence Level:** 4B
**Link:** https://www.nature.com/articles/s41598-024-67122-6