Workplace Research Monthly

January 2026

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 November and December 2025 only.

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Open access, English language article abstracts related to the broad Work, Health and Safety and Rehabilitation/Return To Work themes of Enabling Healthy & Safe Workplaces, Enhancing Employer Capability, Fostering Work Participation, Promoting Mental Health and Adapting to the Future of Work, published in the preceding month are sourced from PubMed© , Emcare©, Ergonomic Abstracts© and Psychinfo© databases at the start of the month. Results are screened by two reviewers, critically reviewed in terms of level of evidence and relevance to an Australian context, and collated.

Description of Evidence Levels Definitions Used in this Review

Articles are arranged from highest to lowest quality based on levels of evidence and relevance, as outlined in table 1 and 2.

1. **Level of Evidence** –Comcare does not conduct critical evaluations of the articles listed in the Workplace Research Monthly, however, certain study designs are scientifically stronger at answering a question. The scoring hierarchy used is presented below.

Level of Evidence	Description
Level 1	Evidence from a systematic/scoping 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.

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. The post-fix AU denotes that the study has been carried out specifically in Australia
B	Study conducted outside Australia and confounders likely to affect generalisability

Enabling Healthy and Safe Workplaces

Health and Wellbeing

Hearing loss in the working-age population: A systematic analysis from the Global Burden of Disease study 2021

Objective: The working-age population (WAP) refers to individuals aged 15-64, who are the main drivers of production. Among the various factors affecting their productivity, hearing loss plays a significant role. However, epidemiological data on hearing loss in the WAP remain limited. The study analyses the global, regional and national situation of hearing loss in the WAP and predicts the disease burden up to 2040. **Setting**: This study was based on data from the Global Burden of Disease (GBD) 2021 study, covering 204 countries and territories from 1990 to 2021. **Participants**: The study population included all individuals aged 15-64 years, consistent with the United Nations definition of the WAP and adopted in the GBD 2021 study. **Design**: Data on the prevalence and years lived with disability (YLDs) due to hearing loss among the WAP were extracted from the GBD database. The disease burden was represented using both absolute numbers and age-standardised rates (ASRs). Trends were analysed with the estimated annual percentage change (EAPC). Subgroup analyses on sociodemographic index (SDI), gender, disease severity and causes were performed, and projections for 2040 were estimated using the Nordpred model. **Results**: Globally, from 1990 to 2021, the number of hearing loss cases in the WAP increased from 558.08 million to 1.04 billion, and the number of YLDs rose from 14.45 million to 26.55 million. In 2021, the prevalence in the WAP was 19 607.24 per 100 000, with YLDs at 501.81 per 100 000. The EAPC shows an upward trend: the change in age-standardised prevalence is 0.11 (95% uncertainty interval (UI 0.10, 0.12), and the change in age-standardised YLDs is 0.10 (95% UI 0.08, 0.11). High SDI regions have the lowest burden of hearing loss globally. At the regional level, as SDI increases, the age-standardised prevalence and YLDs of hearing loss show a downward trend. In contrast, the burden is higher in Oceania, Southeast Asia, South Asia, Eastern Sub-Saharan Africa and East Asia. The top three countries in terms of prevalence and YLDs are Madagascar, Malawi and Kenya. By 2040, the global prevalence and YLDs of hearing loss in the WAP are projected to be 1.31 billion and 33.30 million, respectively, with ASRs of 19 890.33 and 512.27 per 100 000 population. **Conclusions**: The burden of hearing loss in the WAP is gradually increasing, with differences in prevalence and YLDs across regions, countries and SDI levels. Continued attention is needed for this vulnerable group's hearing loss, along with the implementation of effective measures to reduce future burdens.

A healthy lifestyle education intervention for metabolic syndrome risk reduction among office workers in Ethiopia: A single-blind, randomised controlled trial

The increasing prevalence of metabolic syndrome among office workers in Ethiopia underscores the urgent need for tailored health interventions. This study aimed to implement a healthy lifestyle education intervention designed to reduce the prevalence of metabolic syndrome and evaluate changes in participants' knowledge and attitudes regarding metabolic syndrome, cardiovascular diseases, and risk factors, as well as improvements in healthy lifestyle practices. This 9-month institution-based, single-masked, cluster-randomised controlled trial was conducted among bank employees in Bahir Dar. A total of 226 participants were screened based on waist circumference and blood pressure. The intervention was a personalised educational program focused on lifestyle modifications, delivered by health promotion experts, while the control group received general health advice based on the guidelines on clinical and programmatic management of major NCDs. Outcomes were assessed at baseline and after 9 months, with 207 participants included in the final analysis using an intention-to-treat approach, and generalised estimating equations to assess the intervention's effect between groups. The intervention group exhibited significant improvements, with decreases in waist circumference (5.33 cm), systolic blood pressure (6.96

mmHg), diastolic blood pressure (4·21 mmHg), total cholesterol (34.12 mg/dL), and low- density lipoprotein cholesterol (20·68 mg/dl) (all p < 0.0001). Knowledge scores increased by 7.29 points, fruit intake rose from 0.74 to 1.21 portions, and vegetable intake grew from 1.10 to 1.77 portions. Participation in moderate exercise rose from 29.52% to 53.33%. In contrast, the control group showed modest improvements in some components of metabolic syndrome risk factors. However, there were no significant changes in triglycerides, fasting blood glucose, and stress management, while high density lipoprotein cholesterol levels unfavorably declined in both groups. This study highlighted the impact of a tailored workplace-based healthy lifestyle education intervention on lifestyle behaviors and metabolic syndrome risk factors. The intervention led to positive changes in several behaviors and reduced some risk factors. However, it did not significantly improve triglyceride and fasting blood glucose levels, and there was an unexpected decrease in high density lipoprotein cholesterol. This unexpected decrease of high-density lipoprotein cholesterol may result from lifestyle shifts, including reduced fatty diet intake and rapid weight loss, and other metabolic adaptation process. Future research should focus on targeted strategies and long-term interventions to address these unexpected outcomes. Trial registration: ACTRN12623000409673p, registered April 24, 2023 and is completed.

Bogale et al. 2025.

Exploring factors associated with inflammation in stressed workers: A cross-sectional study

Background: Chronic occupational stress leads to physical and mental illnesses, highlighting the importance of effective stress management in modern societies. Recently, chronic stress-induced systemic low-grade inflammation has garnered increasing attention for its stress response and crucial pathological role in the development of both physical and mental illnesses. In this context, elevated salivary interleukin-6 (sIL-6) levels have been developed as measurable and non-invasive stress indicators. However, the factors associated with sIL-6 in stressed office workers, including the symptomatic manifestations of stress responses, have not been extensively investigated. Since direct measurement of inflammation is costly in routine stress management, identifying symptoms that reliably reflect inflammation could facilitate the development of more effective, inflammation-based stress management strategies. **Methods**: In this cross-sectional study, stressed office workers were recruited through a screening process using a Brief Job Stress Questionnaire. Saliva samples were collected to measure sIL-6 levels, and participants completed questionnaires addressing their occupational environment, symptomatic manifestations, and lifestyle. After excluding one participant owing to a medical history that could potentially affect sIL-6 levels, 128 stressed office workers were included in the analysis. **Results**: Our model-based analysis for symptomatic manifestation demonstrated that elevated sIL-6 was significantly associated with greater feelings of fatigue as well as relatively higher vigor. A separate model-based analysis for stressors revealed a significant association with higher qualitative job overload. Data-driven analyses further supported the finding that elevated sIL-6 was significantly associated with fatigue. **Conclusions**: Our findings suggest that the feeling of fatigue may reflect chronic stress-induced systemic low-grade inflammation in the body, highlighting the importance of self-monitoring fatigue for early intervention. Inflammation-based stress management holds promise in preventing both mental and physical illnesses in stressed office workers.

Koreki et al. 2025.

Is work-related hearing loss associated with dementia? Evidence from a high-risk population

Background: Age-related hearing loss is associated with increased dementia risk. We examined the association between hearing loss and dementia in a population at high risk for hearing loss from occupational noise exposures. **Methods**: We conducted cross-sectional and longitudinal analyses using logistic regression and interval-censored Cox models using data from the Building Trades National Medical Screening Program (BTMed), from inception in 1996 through March 2024. Hearing loss was defined as a speech-frequency pure-tone average ≥ 20 decibels (dB) in the better ear and categorized as mild (20-34 dB), moderate (35-49 dB), moderately severe (50-64 dB), or severe to complete (≥ 65 dB). Dementia was defined using criteria from medical history, physical exams, and medication data across all medical screening examinations. **Results**: The study included 44,000 exams in 24,958 BTMed participants; 54.6% had hearing loss. Hearing loss was strongly associated with dementia prevalence (211 cases, $p < 0.001$), with prevalence increasing by severity. Cross-sectional analysis found a significant association between hearing loss ≥ 20 dB and dementia (adjusted odds ratio = 1.88, 95% confidence interval (CI) = 1.15-3.07). In longitudinal analysis, a Cox model adjusted for confounders estimated a hazard ratio of 1.60 (95% CI = 0.99-2.59, p-trend = 0.0928) for incident dementia. **Discussion**: Cross-sectional results support an association between occupational hearing loss and dementia, consistent in direction with findings for age-related hearing loss; longitudinal estimates were not significant but were directionally similar. If confirmed in other high-risk cohorts with repeated audiometry, these findings underscore the potential for hearing conservation and hearing loss rehabilitation in dementia prevention.

Cloeren et al. 2025.

Association between job characteristics and kidney function among men: A cross-sectional analysis of the Rafsanjan cohort study

Background: Although well-established risk factors for chronic kidney disease (CKD) have been extensively studied, the association between job characteristics and kidney health is an emerging area of interest. **Objectives**: This study aimed to investigate the association between job type and kidney function in men participating in the Rafsanjan Cohort Study (RCS). **Methods**: This cross-sectional analysis included 4,457 male participants from the RCS as part of a prospective epidemiological research study in IrAN (PERSIAN). RCS was started in 2015 in Rafsanjan, southeast Iran. Kidney function was assessed using estimated glomerular filtration rate (eGFR), blood urea nitrogen (BUN), and serum creatinine (Cr) levels. Logistic and linear regression analyses were used to examine the association between job type (categorized by skill level and groups) and kidney function parameters, with adjustment for confounders. **Results**: Men in higher skill categories (3 and 4) exhibited significantly increased odds of the G2 category of eGFR (OR: 2.32 and 1.63, respectively) and elevated Cr (OR: 2.53 and 1.80, respectively) compared to those in the unskilled category (Skill Level 1), even after adjustment. These associations persisted after excluding participants with diabetes and hypertension. Several occupational groups, including Professionals, Managers, Technicians, and Associate Professionals, as well as Plant and Machine Operators, showed higher odds of reductions in eGFR and elevated Cr. In contrast, Elementary occupations were associated with higher eGFR levels. Regarding employment status, retired participants had decreased odds of elevated BUN. An interaction analysis revealed that high-skill workers (Skill Level 3) with severe physical activity had significantly higher odds of elevated Cr (OR: 4.77) and reduced eGFR (OR:5.36). **Conclusions**: This study highlights the significant associations between job characteristics and kidney function parameters among males, with high-skill occupations and specific occupational groups showing increased odds, independent of traditional CKD risk factors. A synergistic effect was observed between high-skill jobs and high physical activity. Future longitudinal studies are essential to verify these associations and elucidate underlying mechanisms.

Jamali et al. 2025.

Health trends among workers in Germany and the role of changing job activities and working conditions

Previous studies have found some evidence for worsening health trends in working age adults. This study aims to further investigate the time trends in self-rated health among workers and explore the potential role of changes in job activities and working conditions in explaining these trends. Data from the BIBB/BAuA Employment Surveys conducted in 2006, 2012, and 2018 were analyzed (N = 53,747, age 15+). The study variables included self-rated health as the dependent variable, and time period, age, gender, education, working hours, physical work activities, cognitive work activities, ergonomic working conditions, environmental working conditions, work intensity, work control, and work support as predictors. Logistic regression and mediation analyses were employed to study the associations between these variables and self-rated health over time periods. The findings revealed a significant deterioration in self-rated health among workers over the study period, alongside an aging and more educated workforce. Additionally, several working conditions and work activities underwent changes, with work becoming generally less physically demanding and more cognitively and psychosocially demanding. The changes in job activities and working conditions partly explained the negative trends in self-rated health, with work control and environmental conditions being most important. In conclusion, worsening trends in self-rated health among the working population were found. While changes in the world of work (especially perceived work control and hazardous environmental conditions) contribute to these trends, they constitute only part of the explanation. Further research is needed to identify further intermediary determinants driving these trends and develop targeted interventions to promote worker health and well-being.

Beller et al. 2025.

Occupation and female breast cancer mortality in South Africa: A case-control study

Breast cancer is the most frequently diagnosed malignancy among South African women and remains a leading cause of cancer-related death, yet the role of occupation as an independent predictor of mortality has not been evaluated nationally. In this unmatched case-control study using 2011-2019 mortality data, we compared 13,207 breast cancer deaths with 64,849 non-malignant circulatory disease deaths among women aged 30 years and older, classifying usual occupation into major and sub-groups. A multivariable binary logistic regression adjusting for age, year of death, education, province of death and smoking status was conducted. We observed that compared with elementary occupations, breast cancer mortality was significantly higher during 2011-2015 among legislators, senior officials and managers (aMOR = 1.79, 95% CI: 1.36-2.36), clerks (aMOR = 1.75, 95% CI: 1.46-2.11), professionals (aMOR = 1.62, 95% CI: 1.36-1.94), craft and related trades workers (aMOR = 1.55, 95% CI: 1.18-2.05), technicians and associate professionals (aMOR = 1.54, 95% CI: 1.21-1.96), and service workers, shop and market sales workers (aMOR = 1.33, 95% CI: 1.10-1.62), with similar patterns persisting in 2016-2019 where technicians and associate professionals (aMOR = 1.69, 95% CI: 1.44-1.98), legislators, senior officials and managers (aMOR = 1.59, 95% CI: 1.20-2.10), professionals (aMOR = 1.47, 95% CI: 1.23-1.75), clerks (aMOR = 1.43, 95% CI: 1.24-1.65), and service workers (aMOR = 1.34, 95% CI: 1.12-1.61) again showed elevated odds. The sub-occupation analyses for 2011-2015 identified strikingly high risks among building and related trades workers excluding electricians (aMOR = 8.01, 95% CI: 3.06-20.96), legal, social and cultural professionals (aMOR = 3.32, 95% CI: 2.18-5.04), and business and administration professionals (aMOR = 2.18, 95% CI: 1.60-2.97). The results underscore

occupation as an essential determinant of breast cancer mortality, highlighting the need for targeted prevention and screening strategies in workers.

Job control and working life expectancy in Sweden

Objectives: This study aimed to investigate the impact of low job control on labor market participation expressed through working life expectancy (WLE) and working years lost (WYL) among men and women in Sweden. **Methods**: A random sample of 100 000 individuals was drawn from the Swedish Work, Illness, and labor market Participation (SWIP) cohort of the registered Swedish population in 2005 born 1945 to 1975. The multi-state estimated labor market affiliation method was used to estimate WLE and WYL due to unemployment, sickness absence, other, disability pension, early old-age pension, and death over a 15-year period (2006-2020). Job control was assessed through a job exposure matrix. **Results**: Men and women in high-control jobs had a longer WLE at each age. At age 30, the WLE for men in high-control jobs was 26.3 years while for men in low-control jobs this was 2.5 years shorter. For women, WLE at 30 was 25.8 years for high-control jobs but nearly five years shorter for low-control jobs. For both men and women, these differences were mostly due to disability pension and unemployment. Those in lower control jobs could expect to lose more working years according to nearly all other states besides active employment.
Conclusions: Higher job control is linked to longer WLE, while low job control is an important determinant of WYL in the Swedish workforce. Addressing low job control could extend working lives and reduce inequities in labor market outcomes.

Social harmony at work: A sharedness index linking team atmosphere to individual well-being in a Japanese company

Social harmony, defined as the flourishing of interdependent relationships, is central to well-being in workplace teams but is often measured with abstract self-reports that offer limited interpretability and limited guidance for interventions. This study aims to operationalize social harmony as an interpretable sharedness index and to test its association with individual well-being. In a two-month field study at a Japanese company, 94 employees from 23 teams submitted daily reports containing an 11-point well-being score, an 11-point team atmosphere score, and a short diary entry. We computed two weekly team level indices. The score-based sharedness index was defined as the negative of the within team standard deviation of team atmosphere scores. The text-based sharedness index was defined as the mean semantic similarity among members weekly concatenated diaries using Word Mover's Distance. Across team weeks, score-based sharedness correlated positively with mean individual well-being ($r = 0.332$, $p = 0.0002$), and text-based sharedness showed a weaker but significant correlation ($r = 0.257$, $p = 0.003$). Convergent validity with social harmony was indicated by team level associations with the Interdependent Happiness Scale (score-based $r = 0.66$, $p = 0.019$; text-based $r = 0.44$, $p = 0.086$). These findings suggest that sharedness reflects a practically interpretable component of social harmony in workplace teams and is positively associated with individual well-being, although causal and intervention effects remain to be tested. The index can be computed from routine ratings and diaries, which supports its use for monitoring and for designing interventions to promote employee well-being.

18-yr cumulative incidence of respiratory outcomes is related to employment sectors in a general population sample

Job-related exposures play a significant, often disregarded, role in respiratory outcome development. Evaluating how this exposure impacts the incidence of respiratory illnesses in the general population is crucial for prevention and occupational health surveillance. A total of 823 workers/ex-workers from Pisa (Italy) participated in 2 surveys over 18 years (PI2 1991-93, PI3 2009-11). Health status, occupational sector, and individual risk factors were assessed through a questionnaire; airway obstruction (AO) by spirometry. Exposure was defined as working for at least 3 months in a sector at risk for respiratory diseases at PI2. Cumulative incidence was calculated as "incident cases/population at risk". The relationship between outcome incidence and occupational exposure was assessed through multiple logistic regressions adjusted for baseline (PI2) risk factors. Analysis of covariance estimated the effect of occupational exposure on changes in FEV1/FVC over time. Associations were found among occupational exposure and outcome incidence: agriculture for usual cough/phlegm (OR 2.16, 90% CI 1.17-3.99) and AO (3.06, 1.14-8.24); mining industry/quarries/excavation for attacks of shortness of breath with wheezing (SOBWHZ) (2.41, 1.16-5.02) and AO (2.95, 1.20-7.26); textile industry for asthma (2.61, 1.00-6.79), chronic obstructive pulmonary disease (COPD) (2.56, 1.35-4.85), SOBWHZ (3.09, 1.57-6.06) and wheezing (2.00, 1.00-3.97); wood industry for asthma (3.16, 1.21-8.26); mechanical industry for AO (2.34, 1.06-5.18). Agriculture and mining industry/quarries/excavation were also related to a greater decrease in the FEV1/FVC values. Longitudinal analyses confirm that employment in high-risk sectors, particularly the textile industry, is a significant determinant of respiratory disease incidence and lung function decline.

Maio et al. 2025.

Occupational stress and substance use-related stigma among criminal attorneys

Problematic substance use is a national crisis in the United States. While criminalization of substance use places the criminal legal system (CLS) on the front lines of this crisis, little is known about how this impacts the CLS workforce. From October 2022 to March 2023, informed by the Health Stigma and Discrimination Framework, we conducted qualitative interviews with practicing criminal attorneys using a semi-structured interview guide focused on drivers, facilitators, and practices of substance use-related stigma. Stigma toward individuals with substance use disorders (SUD) has been shown to influence professional behavior, treatment access and outcomes. Inductive and deductive thematic analysis explored experiences of occupational stressors, personal substance use, and attitudes toward defendants in substance use-related cases. Interviews with 17 participants (7 women, 10 men; 88 % White; mean years of legal experience: 13.4, standard deviation: 7.8) revealed a demanding work environment characterized by severe pressures, high-volume caseloads, and the pervasive role of substance use in many cases. Occupational stressors diminished CLS attorneys' empathy towards defendants and minimized their attention to their own behavioral health. CLS work environments normalized substance use among attorneys (i.e., alcohol), fueling challenges faced by professionals and those encountered by defendants. Respondents lacked evidence-based SUD resources, resulting in ineffective case resolution and increased occupational stress. A sense of futility and emotional exhaustion was expressed about defendants with recurrent substance use-related cases. Overall, we found that failure to effectively address substance use-related harms drives occupational stress and stigma among CLS professionals. Further research is necessary to inform CLS-focused interventions.

Gerber et al. 2025.

Working life experiences of people who stutter in Finland: Recommendations for enhancing inclusive communication at work

Purpose: People who stutter (PWS) face public stigma, characterized by negative societal beliefs and stereotypes. Due to lack of awareness, PWS may be perceived as inferior and less intelligent, capable, and social, affecting their psychological well-being. While some aspects of the impact of stuttering-such as income, role entrapment, and discrimination-have been explored in previous research, less is known about the deeper personal experiences of PWS in working life. This study highlights the workplace experiences of PWS, their personal aspirations, and ideas for improvement. By understanding more of PWS' experiences and emotions related to communication at work, it is possible to create a more inclusive working life.
Method: Data were collected through an online survey from 45 Finnish participants over the age of 18 who stutter and have work experience. The data were analyzed using Interpretative Phenomenological Analysis (IPA) and thematic analysis. **Results**: Over half the participants (n = 25, 56 %) reported that they do not speak openly about their stuttering within their current or previous work community. PWS described their experiences in terms of fears of public stigma, internalized stigma, and resisting stigma-driven assumptions. PWS expressed a desire for increased awareness of stuttering and for the promotion of greater inclusivity in working life. **Conclusion**: Negative experiences of PWS often reflect broader societal attitudes. Participants suggested implementing flexible communication strategies to create inclusive workplaces, reducing microaggressions, supporting productivity, and enhancing job satisfaction. Embracing communication diversity can unlock employee potential and foster inclusivity. Respecting privacy and not requiring disclosure of personal information is crucial.

Work Health and Safety

Eye injury epidemiology in Australia: A 25-year systematic review and public health perspective

Background: Eye injuries are a significant cause of monocular blindness, contributing to individual morbidity and substantial healthcare costs. Despite this burden, eye injury prevention remains underrepresented in Australian public health initiatives. This systematic review (PROSPERO ID: CRD42024551054) aims to provide the first comprehensive nationwide synthesis of eye injury epidemiology in Australia. **Methods**: Three databases (MEDLINE, Embase, Web of Science) were searched to identify Australian studies on eye injuries from 1 January 2000 to 1 May 2024. Studies were excluded per the following criteria: not in English; did not exclusively evaluate eye injury (e.g., evaluated all causes of blindness); only evaluated outcomes after injury; sample size < 25; conference abstracts, editorials, letters to the editor/other review articles. Critical appraisals of included texts were performed using the Joanna Briggs Institute Checklist for Analytical Cross-Sectional Studies. Results were synthesised using the International Globe and Adnexal Trauma Epidemiology Study (IGATES) as a framework. **Results**: In total, 30 studies were included, ranging from statewide audits to nationwide surveys. Eye injuries were commonest among young males in occupational settings and older adults experiencing falls at home. Paediatric eye injuries frequently occurred during sport or at home. Rural Australians and First Nations women were disproportionately affected by assault-related injuries, including domestic violence. **Conclusions**: This review highlights key demographic and contextual risk factors for eye injury in Australia and establishes a

robust evidence base to inform targeted, data-driven national prevention strategies. The main limitation of this review is the heterogeneity of included studies, which emphasizes the importance of using international, standardised registries such as IGATES.

Enablers and barriers for allied health professionals working in the Australian aged care or adult disability sector: A scoping review

Background: The ageing population and increasing rates of chronic disease create many challenges to the delivery of high-quality care for older adults and adults with disabilities. Allied health professionals provide a critical role in supporting quality of life and independence in both the aged care and the adult disability sectors, yet recruitment and retention of allied health professionals in these sectors remains a major health workforce concern. This scoping review aimed to identify the enablers and barriers influencing allied health professionals to work in the aged care or adult disability sectors in Australia, as well as to highlight successful strategies for their recruitment and retention. **Methods**: This scoping review was conceptualised using the Population Concept Context Framework and conducted using methods as described by Arksey and O'Malley 2005 and the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). A search of electronic databases, including Medline, Emcare, CINAHL, Scopus, Psych Info, university platforms EbscoHost and ProQuest Health and Medicine, ProQuest Business and grey literature databases was undertaken initially in March-June 2023 and repeated in August 2024. Content and thematic analysis of the key findings were employed to provide a contextualised and comprehensive understanding of study aims. **Results**: Twenty papers met the inclusion criteria, including 5 cross-sectional studies, 13 qualitative studies, 1 mixed-method study, and 1 senate enquiry. From the included articles several workforce related enablers and barriers, related to allied health professionals working in the aged care and adult disability sectors, were reported. As a result of the thematic analysis, four overarching themes were identified that incorporated both enablers and barriers, including: (a) supporting clinicians to work in diverse and complex environments, (b) developing the pipeline to build workforce capacity, (c) navigating system-wide challenges, and (d) appreciating the added complexity of rural practice. **Conclusions**: Findings from this review provide sector employers, government, and policy makers with an understanding of the potential enablers and barriers encountered by allied health professionals working in the aged care and disability sectors in Australia. The review suggests that some barriers could become enablers when appropriately supported, which highlights the need for future research on this topic. This information may also help to inform the National Allied Health Workforce Strategy in Australia.

Impact of personal protective equipment in preventing occupational injuries: A systematic review and meta-analysis

Background: Occupational injuries remain a significant public health concern across diverse industries, with personal protective equipment (PPE) widely advocated to mitigate risk. However, the real-world effectiveness of PPE and factors influencing its use require synthesis. Our objective is to determine whether the use of personal protective equipment (PPE) reduces the occurrence of occupational injuries among

workers in high-risk industries. **Methods**: A comprehensive search was done to include all relevant studies published between January 2000 and June 2025 in PubMed, Scopus, Web of Science, Cochrane CENTRAL, and Embase, following the PRISMA 2020 recommendations. Studies that met the criteria included adult workers in construction, mining, manufacturing, agriculture, or related fields. They examined PPE interventions (helmets, gloves, goggles, respirators, safety shoes, high-visibility apparel, and harnesses) and reported on injuries and compliance measures. Two reviewers independently screened studies, extracted data, and assessed quality using the Joanna Briggs Institute checklist. Random-effects meta-analyses were performed in R to pool injury prevalence, PPE effectiveness (ORs), and compliance rates; heterogeneity was quantified via I 2, and publication bias via funnel plots and Egger's test. **Results**: Eighteen cross-sectional studies (n = 7,612 workers) were included. A meta-analysis of 15 studies (N = 6,325) found that only about half of workers used personal protective equipment (PPE) (pooled prevalence = 51%, 95% CI 39-62%) with extreme heterogeneity. Industry type, rather than age or gender, explained the most variability, with use being higher in industries such as heavy industry, metalwork, and manufacturing. The main barrier was a lack of PPE (72%), followed by discomfort, poor training, and time-saving motives. Compliance was highest for basic equipment and lowest for specialized equipment. Supervision and safety training significantly reduced the risk of injury (OR = 2.04 and 1.81, respectively). **Conclusion**: PPE use is associated with lower odds of occupational injury, and the prevalence of occupational injuries is higher when PPE is available, properly fitted, and supported by training and supervision. However, low compliance was driven primarily by supply and ergonomic factors. Integrated strategies encompassing reliable PPE provisioning, user-centered design, comprehensive training, and organizational commitment are essential to enhance workplace safety.

Climate-related heat stress and psychological outcomes in self-employed delivery workers: Evidence from Brasília, Brazil

This study examines whether daily heat exposure worsens psychological well-being among self-employed motorcycle delivery workers in Brasília, Brazil. Using ecological momentary assessment over 15 consecutive days in August 2025, 45 workers were recruited and 30 (66.7%) completed twice-daily mobile prompts (12:00 and 18:00) rating stress, fatigue, mood, and perceived heat (1-5 scales) and reporting kilometers traveled. Environmental data (temperature, relative humidity, barometric pressure) were paired from the INMET Brasília station. Linear regressions with cluster-robust standard errors by participant tested associations. Higher temperature was consistently related to greater strain: each +1 °C was associated with higher stress (β = 0.196, 95% CI 0.179-0.213), higher fatigue (β = 0.289, 95% CI 0.284-0.295), and worse mood (β = 0.149, 95% CI 0.130-0.168). Adding relative humidity yielded small but reliable partial effects (lower stress and better mood, yet higher fatigue) amid strong dry-season collinearity between temperature and humidity. The findings indicate that even modest day-to-day warming corresponds to measurable deterioration in psychological outcomes in a precarious, outdoor, platform-mediated workforce. Policies that expand hydration and shaded rest access, integrate heat indices into alerts, and adapt platform scheduling to reduce peak-heat exposure may mitigate risk.

From safety commitment to safety behavior: The mediating role of safety awareness

To deeply analyze the mechanism of workplace safety climate on employee safety behavior, a conceptual model of employee safety behavior was constructed based on the theory of stimulus-organism-response (SOR). Structural equation modeling was used to test the model and hypotheses. The results show that safety communication and safety regulation have a significant positive impact on employees' safety commitment and, consequently, on their safety compliance behavior. However, safety communication has no significant impact on employees' safety awareness. Safety regulation can significantly improve employees' safety awareness, which in turn enhances their compliance behavior. Employees' safety compliance behavior directly affects their participation behavior and plays a completely mediating role in the influence of safety commitment and safety awareness on safety participation behavior.

Work-related slip, trip and fall injuries reported by National Health Service staff in Great Britain: How many are due to slipping?

Background: Workplace injuries due to a slip, trip or fall on the level (STF) are often reported together, making the potential impact of targeted interventions, such as slip-resistant footwear, difficult to assess. The objective of this research was to review workplace non-fatal injuries reported as STFs under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 to determine what proportion of staff STF injuries reported by the National Health Service (NHS) in Great Britain were caused specifically by a slip. **Methods**: The free text descriptions of all 1004 STF injuries reported by NHS staff in summer 2018 and winter 2018/2019 were independently reviewed by two researchers to determine whether a slip was the primary cause or not. Where agreement could not be reached or the cause was unclear, an STF specialist reviewed the reports to establish the likely cause. The kappa statistic was used to measure inter-reviewer agreement, and the $\chi2$ test was used to compare proportions across seasons. **Results**: The reviewers agreed on the initiating event, slip or non-slip, for 917 (91.3%) of the incidents. The kappa statistic was 0.842 (95% CI 0.785 to 0.898) indicating strong agreement between reviewers. In total, 431 or 42.9% (95% CI 39.8% to 46.1%) of the STF incidents were slips. This percentage was greater in winter compared with summer (49.0% and 36.0%, respectively, p<0.001). **Conclusion**: The high proportion of slips among reported STF injuries implies that an effective intervention targeting workplace slips in the NHS could have a substantial impact on the number of injuries reported.

Bridging the occupational policy to practice gap: User-centered designed toolbox talks for landscaping tree care

Introduction: Landscaping and tree care work are among the most dangerous jobs in the U.S. with fatality rates more than five times the national average, and injury rates twice as high. Despite these alarming statistics, these occupations remain largely unregulated, with little safety training information available for workers. **Aim**: This study aimed to address this gap by developing culturally relevant, policy-driven, safety "Toolbox Talks," tailored to the landscaping and tree care industry. The specific objectives were to evaluate the usability of prototype Toolbox Talks, and validate their clarity, applicability, and usefulness for small business environments. **Methods**: This was a mixed-methods study that involved workers and supervisor participants (N = 60) from small landscaping and tree care companies. Prototype Toolbox Talks were

developed and field tested with participants. User "pain points," or issues related to design layout, terminology, graphics, were identified in group sessions, and revised based on iterative testing. **Results**: In final testing sessions, workers (n = 37) and supervisors (n = 23) consistently described Toolbox Talks being "highly needed" and "relevant" for addressing workplace hazards and promoting safe practices. Narrative "true story" examples strongly resonated with workers, reinforcing hazard recognition, and prevention strategies. Supervisors reported increased confidence in delivering Toolbox Talks, noting improved clarity during trainings. The use of Spanish terminology and phrasing enhanced accessibility for Spanish-speaking participants. **Conclusion**: Engaging users directly in the development process significantly improved the relevance, clarity, cultural fit, and alignment of Toolbox Talks with the needs of landscaping and tree care workers and supervisors. This participatory approach enhanced usability and demonstrated that Toolbox Talks can serve as a practical, scalable model for strengthening safety communication in high-risk occupations with limited regulatory oversight.

"I'm Not Right to Drive, but I Drove out the Gate": Personal and contextual factors affecting truck driver fatigue compliance

Truck drivers experience an elevated risk of being involved in a fatigue-related crash or incident. In Australia, approximately one third of fatal truck crashes are fatigue-related. Various contextual factors are known to increase truck crash risk, including long working hours, irregular schedules, delays while loading and unloading and limited access to suitable rest areas. Studies investigating personal factors affecting Australian truck drivers' attitudes and compliance with fatigue-management requirements, however, are lacking. Semi-structured interviews were conducted with Australian truck drivers and transport managers (N = 44) to determine how personal and contextual factors influence their intention to comply with fatigue regulation. The findings indicate that personal factors such as familial pressure, financial viability as well as inflexible enforcement and its personal consequences may influence fatigue-related health risks and compliance behaviours. This includes contextual factors such as work scheduling, training and new risk monitoring technologies. It is argued that government, transport industry peak bodies, managers, unions and truck drivers should work together to co-develop fatigue management strategies that account for personal factors likely to influence truck drivers' intentions regarding fatigue compliance. This will support them to engage in safer and healthier fatigue management practices.

High-pressure injection injury with concrete to the hand and forearm

High-pressure injection injuries to the upper extremities are uncommon yet serious, particularly when they involve substances such as concrete. These injuries, frequently occurring in industrial environments, can lead to substantial tissue damage and functional impairment. A 24-year-old male patient who incurred a high-pressure concrete injection injury to his left hand and forearm while employed at a construction site was admitted. The injury, originally seeming minor, involved concrete penetration into the thenar region and extended through the forearm, resulting in significant damage to muscles, tendons, and nerves. The immediate medical care comprised immersion of the injured arm in warm water, administration of intravenous antibiotics, and tetanus prophylaxis, succeeded by rapid debridement in the operating room.

Through a series of surgeries, comprising sequential debridements and reconstructive interventions, hand function of the patient was acceptable regarding the occupational return. Radiographic imaging was essential in evaluating the severity of injury and informing surgical choices. Preoperative radiological clarification of the extension of the upper extremity to the anatomical regions with high pressure is of utmost importance in determining the location and size of the surgical incision to remove the vital initial debridement and cement from the anatomical regions as much as possible. This case highlights the significance of prompt identification, assertive treatment, and sequential surgical procedures in high-pressure injection injuries. The necessity for proactive workplace safety protocols and heightened awareness of the potential severity of these injuries is underscored. We believe that this case report enhances the comprehension of the difficulties and problems associated with treating high-pressure concrete injection injuries to the upper extremities.

Risk Assessment

Identifying predictors of Australian workers' illicit substance use: A nationally representative study

The use of illicit substances among the Australian workforce has significant implications for workers' health, productivity, and workplace safety. To inform targeted interventions, the present study examined the prevalence of weekly illicit drug use among Australian workers, identified the specific substances being used, and analysed the sociodemographic, health, and behavioural factors associated with increased use. This study involved a secondary data analysis of employed participants (N = 12,557) from the nationally representative 2022-23 National Drug Strategy Household Survey. Seven percent (estimated N = 913,356) of workers indicated that they engage in weekly illicit drug use, with a substantial majority of users reporting cannabis use (5.35 %). The Construction industry was identified as the industry of concern when considering both the estimated number of users (N = 88,142) and the prevalence of use (10.23 %). The multivariate logistic regression analysis revealed that factors including male gender (OR = 1.78, 95 % CI [1.28, 2.47]), being 14-24 years old (OR = 3.91, 95 % CI [1.45, 10.55]), unmarried status (OR = 1.86, 95 % CI [1.25, 2.76]), chronic pain (OR = 1.82, 95 % CI [1.11, 2.99]), smoking (OR = 3.45, 95 % CI [2.41, 4.94]), and high-risk alcohol consumption (OR = 7.89, 95 % CI [3.28, 18.98]) were all linked to higher odds of engaging in illicit drug use. The findings from this paper can guide policymakers and organisations in developing targeted interventions for individuals at high risk of illicit drug use, thereby enhancing the health and productivity of the Australian workforce.

Root cause analysis of accidents and examining their interrelations from the perspective of workers, supervisors, and safety officers

Identifying the root causes of accidents and analyzing their causal relationships is a fundamental step in designing effective preventive strategies. This study aimed to uncover the root causes of mining accidents and determine the interactions among them from the perspectives of workers, supervisors, and safety officers using a mixed qualitative-quantitative approach and the fuzzy DEMATEL method. The study was

designed as a mixed-method approach (qualitative-quantitative). In the qualitative phase, a total of 69 interviews were conducted (23 with workers, 21 with supervisors, and 25 with safety officers) to identify and categorize the root causes of accidents. In the quantitative phase, 33 participants (11 from each group) took part in expert panels where the fuzzy DEMATEL method was employed to analyze the relationships among the factors. The qualitative phase results revealed that workers primarily pointed to operational deficiencies, equipment issues, and workplace conditions. Supervisors emphasized human behavior, psychological stress, and a lack of safety culture, while safety officers highlighted managerial weaknesses and inefficient communication structures. The quantitative phase results identified management as the primary and most influential factor, whereas other factors, including humans, machinery, environment, and materials, predominantly appeared as dependent factors. This study's findings suggest that understanding and analyzing the causal relationships among factors, coupled with integrating diverse perspectives, can aid in designing effective preventive strategies and reducing mining accidents. This approach enhances safety, productivity, and job satisfaction.

Requirements for occupational exposure limits in psychosocial risk assessment: What we know, what we don't know and what we can learn from other disciplines

Objectives: This discussion paper aims to provide recommendations for the development of occupational exposure limits (OEL) for psychosocial hazards. By comparing the characteristics of non-psychosocial and psychosocial hazards at work as well as approaches to derive occupational limit values for both types of hazards, the paper summarizes conceptual requirements and methodological perspectives for OEL in psychosocial risk assessment. **Methods**: An interdisciplinary working group comprised of academics, active practitioners in company occupational health management and members of national committees advising policymakers conducted regular face-to-face and online meetings between October 2022 and August 2024 to draft a narrative review and discussion of the current state of research on OEL for psychosocial hazards within the fields of psychology, sociology and medicine. **Results**: The current field of research is in its early stages, indicated by individual efforts and a lack of joint decision-making. Existing approaches towards OEL focus on disease-level outcomes (eg, burnout, depression), which limits their effectiveness for primary prevention and identifying early warning signs of harm. **Conclusion**: Based on the limited existing literature, we recommend (i) the use of outcome variables that enable detection of early stages of adverse effects aligned with the no-observed adverse effect level (NOAEL) and the lowest-observed-adverse effect level (LOAEL), (ii) standardization and harmonization of hitherto independent assessments of identical hazards, and (iii) policy-level actions to foster collaborative decision-making based on the full spectrum of scientific evidence.

Ergonomics

Adaptations to fatigue during a repetitive multiplanar lifting task

Warehouse workers are often required to perform physically demanding repetitive lifting tasks leading to fatigue. Previous research has primarily focused on constrained lifting tasks when investigating fatigue. The purpose of the current study was to investigate fatigue-based movement adaptations during a multiplanar,

ecologically relevant lifting task. Participants (n = 28) lifted, transferred, and lowered a mass continuously for 60 min. Full body kinematics and muscle activity of the lumbar erector spinae, rectus abdominis, external oblique, and anterior deltoids were collected continuously. Results suggest that the load moment arm decreased across the trial (4% decrease), and participants tended to complete movements faster (4% decrease). Further, participants exhibited less variability in thorax-pelvis flexion deviation phase when fatigued (9% decrease). Finally, rectus abdominis activity increased (4%MVIC increase), while anterior deltoid activity decreased over time (2% decrease). These behavioural, coordination-based, and muscular adaptations to fatigue all have potential implications for injury risk in repetitive lifting tasks.

Ratke et al. 2025.
Applied Ergonomics, vol. 129.

Attitudes, needs, and opportunities for training on musculoskeletal disorder risk reduction in masonry

Background: In many countries, including Canada, employers have a legal obligation to provide training programs to the new workers to reduce the risk of musculoskeletal disorders (MSDs). However, current safety and health training modalities, including those specific to ergonomic and MSD prevention, have shown limited success in promoting safe motions patterns. As workers gain more experience, they develop the knowledge and skills necessary to consistently demonstrate safer and more productive performance in tasks within their areas of expertise compared to novices and apprentices. Training apprentices using expert work strategies is a potential intervention that can reduce MSD risk while balancing productivity needs. By understanding the perspectives of experts in the field, we investigate the specific needs of masonry workers and their employers to improve masons' safety and health. **Methods**: This study conducted qualitative user interviews with eight masonry instructors with more than 20 years of experiences from the Ontario Masonry Training Centre. The eight instructors had an average of 23.9 years of experience as masons with a range between 10- and 43-years. As instructors, they had an average of 6.9 years' experience with a range between 1.5- and 18-years. **Results**: Thematic analysis using template methodology was carried out on the data collected and identified six key themes: knowledge of muscle injury risks and prevention, safety in masonry, physical demands and MSD risk, the impact of physical demands, safety culture and attitudes, and the role of safety in apprentice training. The instructors' exposure to high physical demands within masonry was a major theme during the interviews. Instructors discussed the high forces, repetition and awkward postures which take a toll on their bodies. Another large theme was about the safety culture and attitudes within the trade. Younger apprentices often think themselves invincible and show less concern towards musculoskeletal safety, whereas the older masons are more concerned. **Conclusion**: The findings highlight the need for apprenticeship training programs to include modules on safe lifting practices, ergonomic awareness, and long-term injury prevention. They also emphasize the importance of mentorship from experienced masons, structured rehabilitation support after injuries, and connecting ergonomic practices to productivity outcomes. Instructors' perspectives provide valuable context to guide the development of ergonomic training systems that are both relevant to masonry work and tailored to the needs of apprentices and their employers.

McFarland et al. 2025.
BMC Public Health, vol. 25, no. 1.

Optimizing ergonomic risk assessment using fuzzy irregular cellular automata: A novel approach to modeling musculoskeletal disorders in industrial workstations

Musculoskeletal disorders (MSDs) and structural musculoskeletal abnormalities cause substantial work-related pain, disability, and productivity loss in industrial workforces; traditional screening tools and single-variable analyses can miss complex, interdependent risk patterns that arise from combined biomechanical exposures, workstation mismatches, and worker characteristics. We aimed to develop and validate a data-driven framework - Fuzzy Irregular Cellular Automata (FICA) - to integrate multi-modal ergonomic measurements, detect high-risk abnormality clusters, quantify their associations with MSDs and demographic predictors, and prioritize targeted ergonomic interventions. Comprehensive data were collected from 415 supervisory/administrative workers (15 objectively measured abnormalities; self-reported MSDs via the Nordic questionnaire; workstation anthropometry; exposure-time logs). FICA represented the inputs as a fuzzy graph and applied Mamdani inference with a voting/colouring routine (FICAVCA) to identify clusters and rank interventions. Model validation used repeated 10-fold cross-validation and benchmarking against alternative algorithms. FICA identified interpretable high-risk clusters (e.g., lumbar lordosis + dropped shoulder, 22.2%) and demonstrated strong predictive performance (accuracy = 0.92; stability index = 0.89). Multivariate analyses confirmed BMI, age, and work experience as key predictors (R^2 = 0.43, p < 0.001); BMI ≥ 30 increased odds of lumbar lordosis (OR = 2.3) and genu varum (OR = 1.9). Model-based intervention simulations estimated prioritized workstation and exercise interventions could reduce cluster risk by up to ≈ 34% (scenario projections). FICA provides an interpretable, scalable method to translate multimodal ergonomic data into prioritized, resource-efficient interventions. Longitudinal trials are needed to validate projected intervention effects.

Kashani et al. 2025.
Scientific Reports, vol. 15, no. 1.
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Keywords: Ergonomic risk assessment; fuzzy irregular cellular automata; musculoskeletal abnormalities; musculoskeletal disorders; occupational health.
Evidence Level: 5B
Link: https://www.nature.com/articles/s41598-025-28916-4

Chronic Health Issues

Stress, pain intensity, and work productivity in individuals with chronic pain: A cross-sectional observational study

Introduction: Chronic pain affects one in three people globally, impacting work performance through absenteeism, presenteeism, and reduced productivity. Factors like mental health, poor sleep, and unhealthy diets exacerbate pain and impair efficiency. Addressing these issues through workplace programs and lifestyle changes could enhance productivity and well-being, improving overall workforce health. This study aimed to analyze the relationship between chronic pain, mental health, lifestyle factors, and work productivity among Spanish adults. **Methods**: This cross-sectional study analyzed chronic pain in adults. Variables included pain intensity, work productivity, physical activity, diet, psychological health, sleep, and smartphone use. Data were collected via validated questionnaires and analyzed using multiple regression models to identify predictors of work productivity. **Results**: This study analyzed 127 adults with chronic pain (72.4% female, mean age 48.12 years). Most had musculoskeletal pain (93.7%), with lumbopelvic (22%) and cervical (15%) regions most affected. Moderate-severe insomnia (61%) and high sedentary work prevalence (65.4%) were noted. Work productivity and absenteeism were associated with pain, mental health symptoms, and insomnia. Depression related negatively to physical activity and diet adherence, while smartphone use correlated with higher depression and anxiety. Insomnia was linked to lower activity and greater psychological distress. Pain intensity and stress explained 18.9% of the variance in health impact on work productivity. **Conclusion**: Pain intensity and stress were significantly associated with reduced work productivity in individuals with chronic pain. Implementing strategies for pain management, stress reduction, and sleep improvement, along with promoting healthy habits in the workplace, is recommended.

García-Pérez-de-Sevilla et al. 2025.

Occupational performance of cochlear implant users: a comparative study with other hearing-impaired and normal-hearing individuals

Objective and design: This cross-sectional study aimed to compare occupational performance of cochlear implant (CI) users to that of adults with hearing impairment without CI and those with normal hearing (NH). We used the Amsterdam Checklist for Hearing and Work to assess job characteristics, hearing activities, need for recovery and other outcomes. **Study sample:** We included 204 adults: 98 CI users (mean age 51), 52 participants with hearing impairment, without CI (HI group, mean age 49) and 54 participants with NH (NH group, mean age 46). **Results**: Job characteristics were similar between the groups, but the CI and HI groups were significantly more likely to report (effortful) communication in noise compared to the NH group. Need for recovery was significantly higher in the HI than in the NH group, but the CI and NH groups showed no significant difference. The CI group needed less guidance in managing their hearing loss in the workplace than the HI group did. **Conclusions**: The relatively favourable outcomes for CI users in need for recovery and reduced need for guidance at work may be due to the extensive training and counselling they received as part of their rehabilitation program.

Metabolic syndrome and health-related quality of life: Unraveling the role of gender (A SUMS employees cohort-based study)

Objective: Metabolic syndrome (MetS), beyond its well-established link to the rising tide of chronic conditions, casts a significant shadow on individual's daily well-being, diminishing their Health-related quality of life (HRQOL). This study examines the association between MetS and HRQOL with a focus on gender differences among a cohort of healthcare workers. **Results**: In this study, the prevalence of MetS was 9.3%, with a higher prevalence in men (10.3%) than in women (8.5%). Women with MetS reported significantly lower overall HRQOL scores compared to women without MetS ($\beta = -1.89$, $p < 0.001$), while no such association was found in men ($\beta = 0.05$, $p = 0.922$). Additionally, a significant gender-dependent interaction was observed, with a stronger association between MetS and lower physical HRQOL scores in women than in men ($\beta = -3.17$ vs. $\beta = -2.17$). Findings highlight a gender-specific pattern in the association between MetS and reduced HRQOL, emphasizing the need for targeted interventions.

Navigating work life after colorectal cancer: Insights into work ability and functioning - a Danish follow-up study

Background and purpose: Colorectal cancer (CRC) can affect return to work and sustained work participation. While employment rates have been studied, less is known about how survivors manage work demands after returning, despite frequent long-term symptoms. This study investigated work participation

and perceived work functioning 12 and 24 months after surgery. Patient/material and methods: Data stemmed from a Danish late sequelae screening programme including CRC patients aged ≥18 years who were affiliated with the labour market at diagnosis (2021-2024). Participants reported employment status, work role functioning, and work ability. Clinical data were retrieved from a national database. Multivariable logistic regression models, adjusted for cancer type, sex, and age, assessed factors associated with work functioning. **Results**: At 12 months (n = 474) and 24 months (n = 257), 76% and 78% were employed. Just over half reported high work role functioning, and the majority reported high work ability at both follow-up points. Bowel-related problems were associated with lower work role functioning (12 months: odds ratio [OR] 0.35, 95% confidence interval [CI] 0.20-0.62; 24 months: OR 0.40, 95% CI 0.18-0.86) and lower work ability (12 months: OR 0.26, 95% CI 0.15-0.46; 24 months: OR 0.20, 95% CI 0.08-0.51). More advanced cancer stage was also linked to lower work ability. **Interpretation**: Most survivors return to work within two years; however, persistent bowel-related problems are associated with reduced work functioning. Rehabilitation should address long-term symptoms to support sustained work participation.

Pedersen et al. 2025.

Acta Oncologica, vol. 30.

Occupational Exposure

Seroprevalence of tick-borne diseases in Europe in occupational settings: A systematic review and metanalysis

Objectives: Tick-borne diseases (TBDs) pose a growing occupational risk due to the expanding geographical range of tick species and their associated pathogens. This study aims to assess TBD seroprevalence among different occupational groups in Europe, identifying high-risk professions and guiding targeted prevention efforts. **Study design:** A systematic review and meta-analysis were conducted following PRISMA guidelines to evaluate TBD seroprevalence in occupational settings across Europe from January 2013 to June 2024. **Methods**: A comprehensive search of PubMed, Web of Science, and Scopus identified 36 relevant studies. Heterogeneity among studies was assessed using Cochran's Q test and the inconsistency index (I2), with sensitivity and outlier analyses applied to evaluate their impact. Publication bias was examined through funnel plot analysis, Egger's test, and Duval & Tweedie's trim-and-fill method. **Results**: Seroprevalence varied significantly across occupations. The highest rates were found for Coxiella burnetii among livestock and dairy producers (up to 73.7 % in Italy) and Borrelia burgdorferi among forestry workers, particularly in Poland. A meta-analysis of 33 studies revealed seroprevalence rates of 8.2 % in military workers (no publication bias), 26.0 % in forestry workers, 8.0 % in veterinarians, and 18.0 % in farmers, with high overall heterogeneity. **Conclusions**: TBD risk is influenced by occupational exposure, environmental factors, and regional differences. Given the substantial variation across worker categories, targeted preventive measures, increased awareness, and enhanced surveillance efforts are necessary to mitigate risks in high-exposure professions.

Morea et al. 2025.

Public Health, vol. 248.

Nasal mucosa micronuclei as early biomarkers of effect in workers exposed to airborne pollutants: A literature overview

Occupational exposure to air pollutants poses a serious health concern for workers, particularly due to potential genotoxic effects. The micronucleus (MN) test is widely recognized as a reliable biomarker of

early genetic damage. Although commonly applied to lymphocytes or buccal epithelial cells, the nasal mucosa, being the first site of contact for inhaled toxicants, has received relatively limited attention. This review aims to evaluate the scientific literature on the use of MN in exfoliated nasal epithelial cells as a biomarker of early genotoxic effects in workers exposed to air pollutants. We conducted a comprehensive literature search using PubMed and gray literature sources. Seventeen studies were identified that examined the frequency of MN in nasal cells of exposed workers, with or without comparison with other biomarkers, such as buccal or blood cells. Most studies have reported a significant increase in MN frequency in nasal cells following exposure to substances, such as FA, heavy metals, wood dust, and industrial chemicals. In some cases, nasal MNs appeared more sensitive than other cellular targets. However, data heterogeneity, lack of standardized protocols, and limited control for confounding factors (e.g., smoking, diet) hinder in-depth comparisons and meta-analyses. Nasal MN testing offers a promising, non-invasive tool for biomonitoring genotoxic exposure in occupational settings. However, further research is needed to develop standardized protocols, control for confounding factors, and clarify the relationship between MN frequency, exposure characteristics, and other biomarkers of effect.

Critical assessment of the recommended alert limit curves for occupational heat exposure

Background: Occupational heat stress recommendations aim to achieve thermal equilibrium and keep core temperature (Tc) below 38.0°C. We assessed the recommended alert limit curves when: (1) work-rest ratios are adjusted based on wet-bulb globe temperature (WBGT) at a fixed rate of metabolic heat production (Hprod) and (2) Hprod is adjusted based on WBGT at a fixed work-rest ratio. We tested the hypothesis that adhering to occupational heat stress recommendations results in thermal equilibrium and prevents TC from exceeding 38.0°C. **Methods**: Unacclimated adults completed 4-hour exposures at a fixed WBGT, Hprod, and work-rest ratio. There were six iterations of compliant trials (n = 70 observations; A: 24.1°C, 431 W, 60:0 min; B: 26.6°C, 461 W, 45:15 min; C: 28.4°C, 462 W, 30:30 min; D: 29.7, 453 W, 15:45 min; E: 27.3°C, 412 W, 30:30 min; F: 31.6°C, 290 W, 30:30 min) and two iterations of noncompliant trials (n = 24 observations; G: 31.6°C, 413 W, 30:30 min; H: 36.1°C, 453 W, 15:45 min). **Results**: Mean and peak TC across the compliant trials were 37.6°C ± 0.3°C and 37.9°C ± 0.3°C. Thus, 65/70 (93%) and 44/70 (63%) trials did not exceed a mean or peak core TC of 38.0°C. Mean and peak TC across the noncompliant trials exceeded 38.0°C in all trials. The rate of heat gain differed between compliant and noncompliant trials (0.08°C ± 0.07°C/h vs. 0.41°C ± 0.34°C/h; p < 0.0001) but on average thermal equilibrium was < 0.1°C/h in the compliant trials. **Conclusion**: Compliance with the occupational heat stress recommendations resulted in thermal equilibrium and mitigated the development of excessive heat strain. **Trial registration:** ClinicalTrials.gov: NCT04767347.

Occupational heat exposure and stomach cancer risk in a pooled analysis of two Spanish case-control studies in the stomach cancer pooling project - StoP consortium

Background: Occupational heat stress occurs frequently and is increasing with climate change. Studies of occupational heat exposure and stomach cancer risk are limited. We used data from the international Stomach cancer Pooling (StoP) Project to investigate the relationship between occupational heat exposure

and stomach cancer risk in a pooled analysis of two Spanish case-control studies, including 566 stomach cancer cases and 2984 controls. **Methods**: The Spanish job-exposure matrix, MatEmEsp, was used to assign heat exposure estimates to participant occupations. We evaluated three exposure indices: ever vs. never exposed, cumulative exposure and duration (years). We calculated odds ratios (ORs) and corresponding 95 % confidence intervals (CIs) using unconditional logistic regression models including terms for potential confounders. **Results**: Overall, 60.6 % of cases and 42.7 % of controls were ever occupationally exposed to heat. Occupational heat exposure was associated with a moderately elevated risk of stomach cancer (OR 1.31; 95 % CI 1.05, 1.63) when comparing ever vs. never exposed individuals in both studies combined. Elevated ORs were also observed across categories of cumulative exposure and duration (p-trend = 0.01 and 0.03, respectively). Findings were robust to additional covariate adjustment and in analysis of never smokers. There was no clear evidence for interaction according to exposure status to other suspected occupational stomach carcinogens. **Conclusion**: Findings from this study provide some evidence for a positive association between occupational heat exposure and stomach cancer risk. Further research is needed to advance occupational heat assessment tools for epidemiological research as well as studies in more geographically diverse populations.

Hinchliffe et al. 2025.

Occupational exposures to inorganic dust are associated with emphysema: The SCAPIS cohort

Objectives: There is a lack of knowledge about whether occupational exposures increase the risk of emphysema, especially in never-smokers. Our objective was to determine if occupational exposures are associated with emphysema and impaired diffusing capacity. **Methods**: In the Swedish CArdioPulmonary bioImage Study (SCAPIS), persons from the general population aged 50-64 answered a questionnaire and underwent CT of the lung as well as assessment of the diffusing capacity of their lungs for carbon monoxide (DLCO), presented as DLCO<lower limit of normal (LLN). Emphysema was defined as emphysema in any part of the lungs. Occupational exposures were assessed by a job exposure matrix based on longest held job. ORs with 95% CIs were calculated using logistic multivariable models. **Results**: In this cross-sectional study (27 370 persons including 13 981 never-smokers), occupational exposure to inorganic dust was associated with emphysema (OR 1.25, 95% CI 1.07 to 1.47), also among never-smokers, (OR 1.46, 95% CI 1.00 to 2.11). There were associations with DLCO<LLN for occupational exposure to inorganic dust and vapour and gases. With all exposures in the same model, inorganic dust was associated with emphysema (OR 1.30, 95% CI 1.08 to 1.57), and vapour and gases were associated with DLCO<LLN (OR 1.17, 95% CI 1.00 to 1.38). In those with emphysema and impaired DLCO, there was an association with inorganic dust (OR 1.65, 95% CI 1.20 to 2.28), also among never-smokers (OR 3.79, 95% CI 1.35 to 10.63). **Conclusions**: Occupational exposures to inorganic dust are associated with emphysema. The association is stronger in those with the combination of emphysema and impaired DLCO indicating serious exposure effects in the alveoli.

Holm et al. 2025.

Ambient air pollutants, increased anaemia risk, and vulnerable subgroups: Evidence from a large group of workers in South China

Background: Previous epidemiological studies indicated a potential correlation between air pollution and anaemia, particularly in children, pregnant women, and the elderly. However, evidence is insufficient for

workers exposed to air pollution while working in environments with other occupational hazards. Based on data from a substantial population of workers in southern China, we aimed to examine the relationships between different air pollutants and both haemoglobin (Hb) concentration and the prevalence of anaemia. **Methods**: In this cross-sectional analysis, we recruited 372 290 workers from the National Occupational Disease Surveillance Platform and utilised a mixed-effects model to explore the association of various air pollutants (including PM2.5, PM10, PMcoarse, O3, and NO2) with Hb concentration and the prevalence of anaemia. We ran stratified analyses by various demographic characteristics and occupational variables. **Results**: Each 5 µg/m3 increase in the concentration of PM2.5, PM10, PMcoarse, O3, and NO2 corresponds to a 2.037 g/L (95% confidence interval (CI) = 1.938, 2.137), 1.096 g/L (95% CI = 1.040, 1.152), 1.412 g/L (95% CI = 1.313, 1.510), 0.518 g/L (95% CI = 0.489, 0.547), and 0.250 g/L (95% CI = 0.219, 0.281) decrease in Hb concentration, respectively. The prevalence of anaemia increased by 11.3% (95% CI = 7.3, 15.5), 5.0% (95% CI = 2.8, 7.3), and 4.5% (95% CI = 6, 8.5) for a 5 µg/m3 increase in PM2.5, PM10, and PMcoarse, respectively, with the impact being more pronounced in the non-benzene-exposed population. Subgroup analyses suggested potential variations in susceptibility to the same air pollutant across different demographics and occupational variables. **Conclusions**: The Hb levels among the workers in our sample were associated with various atmospheric pollutants, with certain demographic and occupational subgroups being particularly vulnerable. These results highlight the need for targeted air pollution control and occupational health interventions, particularly for vulnerable demographic and occupational subgroups.
Li et al. 2025.

Effect of green space in the workplace on hearing thresholds in noise exposed population

The association between greenness exposure and hearing thresholds and the underlying mechanism are unclear. Therefore, this cross-sectional study aims to assess the relationship between greenness exposure and hearing thresholds and whether this relationship is mediated by air pollutants. Our study involved 6016 occupational people examined at an occupational disease screening center. Mean exposure concentrations of air pollutants and green indices [Standardized Difference Vegetation Index (NDVI) and Soil-Adjusted Vegetation Index (SAVI)] were assessed for 250 m, 500 m, and 1000 m buffer zones according to work address. A generalized linear model was used to assess the association between the two, taking into account the influence of workplace clustering effects and applying cluster-robust standard errors (CRSE) to correct for clustering effects. Mediation analysis was used to examine the impact of air pollutant exposure on these associations. After correcting for confounders, compared to the lowest quartile group, exposure to more green space significantly improves hearing thresholds. However, we have not yet found a significant association between air pollutants and the relationship between exposure to green environments and hearing thresholds. Sensitivity analyses also yielded similar results. In summary, increasing exposure to visible green environments outdoors in the workplace may help protect hearing thresholds, but the protective mechanism requires further investigation.
Li et al. 2025.

Per- and polyfluoroalkyl substances exposure in hexavalent chromium exposed workers and the effects of exposure mixtures on oxidative stress and genomic instability

Hexavalent chromium (Cr(VI)) can induce oxidative stress, genomic instability, and epigenetic modifications. In occupational settings, Cr(VI)-exposed workers may also be exposed to other toxicants,

such as elements besides Cr, and per- and polyfluoroalkyl substances (PFAS). However, research on the extent of these co-exposures and their combined effects remains limited. The objective of this study was to characterize the exposure levels of ten elements and eight PFAS in Cr(VI)-exposed workers and to assess the combined effects of these exposure mixtures on biomarkers of oxidative stress and genomic instability. This study included 138 Cr(VI)-exposed workers and 96 controls from Swedish SafeChrom and Danish SAM-Krom studies. Concentrations of elements were measured by inductively coupled plasma mass spectrometry (ICP-MS), and PFAS were measured by liquid chromatography-tandem mass spectrometry (LC-MS/MS). Effect biomarkers, including 8-hydroxy-2'-deoxyguanosine (8-OHdG), mitochondrial DNA copy number (mtDNA-cn), telomere length (TL) and O6-methylguanine-DNA methyltransferase promoter (MGMT) methylation, were analyzed in blood. Bayesian Kernel Machine Regression and quantile-based g-computation models were used to evaluate the mixture effects. Exposed workers had higher concentrations of Cr, manganese, copper, zinc, lead, and perfluoroheptanoic acid (PFHpA), lower mtDNA-cn and longer TL compared to controls. In the SAM-Krom study, perfluorooctane sulfonic acid (PFOS) levels were significantly elevated among exposed workers, with the P95 reaching 2044 ng/mL. The exposure mixtures were associated with increased 8-OHdG and MGMT hypermethylation. Together, these findings highlight the complexity of multiple occupational exposures in Cr(VI)-related work environments and suggest that combined exposure may contribute to early biological alterations related to oxidative stress and DNA methylation.

Jiang et al. 2025.
Environmental Pollution, vol. 387.
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Keywords: Effect biomarkers; hexavalent chromium; multiple exposure; occupational exposure; PFAS.
Evidence Level: 4B
Link: https://www.sciencedirect.com/science/article/pii/S026974912501629X?via%3Dihub

Steady-state auditory evoked potentials in workers exposed to occupational noise

Background: The present study aims to investigate neural synchrony, as measured by Auditory Steady State Response (ASSR), in individuals with normal hearing who are exposed and not exposed to occupational noise, thereby providing insights into hidden hearing loss within the central auditory nervous system, and justifying the importance of exploring auditory neural function in populations at risk. **Methods**: A cross-sectional study involved 30 noise-exposed individuals in the Study Group and 30 unexposed individuals in the Control Group, all paired by an average age of 35 years. The following procedures were performed on all individuals: clinical and occupational history, meatoscopy, immitanciometry, pure tone audiometry, speech audiometry, and ASSR (40Hz). We analyzed the audiometric hearing thresholds at frequencies of 1 kHz and 4 kHz, the electrophysiological thresholds estimated by ASSR, and the comparison of the differences between them: the thresholds estimated by ASSR and the audiometry thresholds. The data were analyzed using both descriptive and inferential statistics. P-values ≤ 0.05 were considered significant. **Results**: When comparing hearing thresholds at 1 kHz and 4 kHz between groups, we found significant differences, with the SG showing higher hearing thresholds than the CG bilaterally. No significant differences were seen in the electrophysiological thresholds estimated by ASSR, nor in the comparison between the ASSR-estimated threshold and the psychoacoustic hearing threshold groups. **Conclusions**: The results of this study suggest that workers exposed to occupational noise did not show detectable changes in neural synchrony in the midbrain, thalamus, or primary auditory cortex when compared to individuals without occupational noise exposure.

Kamita et al. 2025.
La Medicina del Lavoro, vol. 116, no. 6.
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Keywords: Auditory; occupational noise; workers.
Evidence Level: 4B
Link: https://www.mattioli1885journals.com/index.php/lamedicinadellavoro/article/view/17196

The future burden of silicosis and lung cancer among tunnel construction workers in Queensland

Exposure to respirable crystalline silica (RCS) is known to increase the risk of the development of silicosis, in addition to lung cancer and other diseases. While much evidence of the link between underground tunnel construction and the resultant development of silicosis exists, limited information is available on the levels of occupational exposure to RCS or the prevalence of RCS-related disease in tunnelling in Australia. Publicly available RCS exposure data were sourced from the construction of 3 major Queensland tunnelling projects between 2007 and 2013. Statistical evaluation was performed to estimate RCS exposure, and together with estimates of workforce size and risk estimates, the future excess number of silicosis and lung cancer in that tunnelling workforce were estimated. In a cohort of around 2,000 workers who serviced the Queensland tunnel projects, it was estimated that between 20 and 30 cases of lung cancer and between 200 and 300 cases of silicosis would develop over their lifetime as a result of exposure to RCS. This paper highlights the likely future burden of disease, the need for case-finding and better control measures to reduce RCS exposure in this high-risk cohort.

Cole et al. 2025.

Peritoneal mesothelioma and asbestos exposure: A population-based case-control study in Italy, 2000-2021

Objectives: Using a case-control design, we examined the association between occupational asbestos exposure and risk of peritoneal mesothelioma in the general population in Italy. **Methods**: From the National Mesothelioma Registry, we selected cases (2000-2021) with life-time occupational history. Controls were 3045 from three case-control studies (region-sex-age-matched, performed in six regions), one in 2002-2004 (2116 population controls) and two in 2012-2016 (718 population and 211 hospital controls). For all subjects, exposure assignment was based on a quantitative job-exposure matrix (SYN-JEM). Qualitative expert-based evaluation was available for all cases, but only in 2012-2016 for 929 controls. We estimated ORs and 90% CIs using logistic regression models adjusted for residence, gender, period and age. **Results**: In complete analyses (1591 cases, all years/regions), the OR for ever exposure was 3.66 (CI 3.21 to 4.18, 45.4% cases and 27.8% controls exposed). Among the exposed, median cumulative exposure (fibres/mL-years) was 1.4 (max 20.0) in cases and 1.1 (max 10.9) in controls. The OR was 1.55 (1.48 to 1.62) per log10-transformed cumulative exposure. In analyses restricted to 290 cases (same years/regions of controls), ORs were 3.35 (2.57 to 4.37, 43.8% cases exposed) for ever exposure and 1.52 (1.39 to 1.65) for cumulative exposure. ORs for ever asbestos exposure using expert-based evaluation were particularly high, 4.32 (3.50 to 5.34, 53.9% cases and 26.4% controls exposed) in complete analyses (778 cases) and 6.35 (4.58 to 8.81, 57.1% cases exposed) in restricted analyses (245 cases), but are known to be more prone to bias. **Conclusions**: Peritoneal mesothelioma showed clear associations with asbestos exposure using different exposure assessment methods.

Consonni et al. 2025.

Occupational exposure to chemicals and particles and incidence of myocardial infarction: A nationwide cohort study in Sweden

Cardiovascular disease (CVD) is the leading cause of death in Europe, with myocardial infarction (MI) being one of its most severe manifestations. While many risk factors for CVD are well known, occupational

exposures remain relatively understudied-especially in analyses that adjust for co-occurring workplace exposures. This study aimed to examine the association between occupational exposure to chemicals and particles and the risk of first-time MI. The cohort included all Swedish residents born between 1930 and 1990 who were employed between 1985 and 2013 and had no prior MI. Participants were followed from 1986 to 2017, and their occupational histories were linked to the Swedish Job Exposure Matrix (SweJEM) to estimate exposure to 31 chemicals and particles. MI cases were identified through national hospital discharge and cause of death registers. Using discrete time proportional hazards regression, we estimated gender-specific hazard ratios, adjusting for age, decision authority, physical workload, noise, other chemicals/particles, and within a subset smoking and body mass index (BMI). Among 225,366 incident MI cases, the strongest increased risk was associated with both cumulative, ever, and recent exposure to diesel exhaust, polycyclic aromatic hydrocarbons, sulphur dioxide, carbon dioxide, cadmium, chromium, iron, and lead. These associations remained after adjusting for smoking, BMI, and education. Hazard ratios were generally higher among women. The attributable proportion among exposed individuals was 9 %, corresponding to over 20,000 cases during the follow-up period. Our findings highlight the importance of reducing occupational exposure to harmful substances to prevent future cases of MI.

Grahn et al. 2025.

Occupational exposures and skin cancer incidence in six Swiss cantons

Objectives: Most studies on occupational risk factors for melanoma have focused on ultra-violet radiation (UVR) exposure from outdoor work. This study investigates a broader range of occupational exposures including UVR, ionizing and non-ionizing radiation, benzene, poly- and monocyclic aromatic hydrocarbons, hexavalent chromium, nickel, coal tar, black carbon, ozone, soot and nitrous oxides with skin cancer in a working-age population-based prospective cohort. **Methods**: Adult residents (20 to 65 years) in the cantons of Fribourg, Ticino, Vaud, Valais, Neuchâtel, and Genève at the 2000 census were included (n = 1,077,487). Incident cases of primary melanoma and squamous cell carcinoma (SCC) of the skin were retrieved from cantonal cancer registries until 2012. Job-exposure matrices were used to assign exposures, using two assessment methods to explore exposure misclassification (i.e. conservative approach for main analyses vs. inclusive approach for sensitivity analyses). Cox proportional hazard models, with age as timescale and adjusted for demographic and environmental factors (residential radon, ambient UVR, and PM2.5 concentrations) were used to estimate hazard ratios (HR) in relation to each occupational exposure. **Results**: 2757 incident melanoma cases were observed during an average of 8.4 years follow-up. Occupational exposure to UVR and black carbon were associated with melanoma incidence (HR = 1.23; 95 % CI: 1.02-1.50 and HR = 1.59; 95 % CI: 1.18-2.13, respectively). Occupational exposure to ionizing radiation and ozone were only associated with melanoma when using the inclusive exposure assessment method. No associations were found for SCC incidence. **Conclusion**: UVR and air pollution in occupational settings were associated with melanoma incidence. Melanoma related to these risk factors is only recognized as an occupational disease in a few countries, while other occupational risk factors are largely neglected.

Boz et al. 2025.

Increasing physical work capacity losses due to heat stress increase

As global warming continues, hotter and more humid weather conditions become increasingly frequent, heightening population exposure to heat-stress environments. This could lead to a loss of physical work capacity (PWC loss) and result in significant economic risks. Here, we investigate the PWC loss risks and

their recent changes under different heat stress environments for the period of 1985-2023. Changes in PWC loss risks on comfort days, defined by heat stress values of 20-29 °C, show a latitudinal contrast, with an overall decrease in low latitudes and an increase in high latitudes. However, they have increased everywhere on both discomfort days (30-45 °C) and dangerous days (above 45 °C), with a greater increase in the latter condition. This suggests that global warming is exacerbating the risks of PWC loss in more intense heat stress environments. Geographically, Western Europe, the Mediterranean, Siberia, the Caribbean, and northeastern South America have experienced more significant increases in PWC loss risks, exceeding 1.5 times relative to the climatological mean over the past four decades. Such changes are due more to changes in the frequency of heat stress days than to changes in the severity of PWC loss. This finding suggests that the spatio-temporal variations in meteorological aspects should be taken into account when designing policies to address PWC loss risks due to heat stress.

Evaluation of hand-arm vibration exposure during intermittent use of powered hand tools by mechanical trade workers

This study evaluated hand-arm vibration (HAV) risks associated with common tools and tasks performed by automotive trades workers (boilermakers, tire fitters, and heavy vehicle (HV) mechanics) in a workshop that serviced HVs and some light vehicles (LVs). Assessment of task and daily HAV exposure occurred over a week and followed the methodology from AS ISO 5349:2013. Screening for task-based ergonomic hazards was conducted using the Manual Tasks Risk Assessment Tool V 2.0 (ManTRA) and Quick Exposure Check (QEC) tools to inform the HAV assessment. Workers (with varied prior HAV exposure) also completed a screening questionnaire for related health effects that may be caused or exacerbated by HAV exposure. Boilermakers had typical and individual daily HAV exposures exceeding the recommended exposure action value (EAV) of 2.5 m/s2. In comparison, HAV exposures for mechanics and tire fitters were below the EAV. The use of pneumatic needle scalers and impact wrenches was associated with the highest exposure to HAV. Ergonomic risk factor scores were higher for the hand and arm during several boilermaker and tire fitter tasks. Several workers who completed the screening questionnaire were referred for further medical review. Task vibration measurements had a strong positive linear correlation (r = 0.932, P-value <0.001) with the 75th percentile values reported by the Health and Safety Executive (HSE) for tools used prior to 2015. A conservative approach to the management of HAV risks is recommended, based on the variability and uncertainty in measurements and existing risk models.

Effects of noise pollution in construction workers

Construction workers are exposed to typical risk factors such as noise pollution, high stress, and insufficient sleep. However, it remains unclear whether these hazards have an impact on the fatigue state or cognitive abilities of occupational populations. This study investigates the occurrence and distribution characteristics of fatigue and cognitive status among construction workers and explores relevant influencing factors. We conducted facility construction occupational workers as the study population and collected 3 types of data, including occupational health records, questionnaire measurements, and computer program tests. Occupational fatigue and cognitive decline levels of construction workers were assessed after the work cycle. The study included 114 male construction workers meeting the screening criteria, with a mean age of

28.0 ± 7.2 years. 42.11% of the construction workers were engaged in high-noise exposure (85 A-weighted decibels over an 8-hour period). Questionnaire results showed that after one work cycle, 24 (21.05%) and 28 (24.56%) were in a state of high depression or anxiety, respectively, and 32 were diagnosed with a state of high stress. Occupational fatigue was observed in 70 (61.40%), and cognitive decline was determined in 34 (29.82%). A univariate analysis revealed that participants who smoked, drank alcohol, had high seniority, and high noise exposure was at high risk of developing occupational fatigue. Trial participants with high blood pressure, high blood cholesterol, short sleep duration, long working hours, and high noise exposure were more likely to experience cognitive decline. Further multivariate logistic regression analyses showed that high noise exposure had a significant effect on occupational fatigue (OR = 3.2, $P < 0.01$) and that high noise exposure and insufficient sleep (<6 hours) had a synergistic effect on cognitive decline. This study demonstrated that high noise exposure increased the health risks of fatigue and cognitive decline in construction workers, and there was synergistic effect between noise exposure and insufficient sleep.

Immunomodulatory effects of the herbicide glyphosate following occupational exposure

Glyphosate, a widely used herbicide, has raised concerns regarding its impact on human health and the environment due to its widespread and excessive use. Adverse effects on the immune system have been reported. In this study, 26 vineyard workers in Veneto vineyards were examined before and after glyphosate applications to investigate possible immune parameter changes. Glyphosate exposure led to alterations in plasma cytokine levels, including marked increases in IL-4 and IL-5, a modest rise in IFN-γ, and a decrease in IL-8. No changes in plasma IL-12/23p40, IL17 and IL-33 were found. The IFN-γ/IL-4 ratio decreased, accompanied by changes in T cell subpopulations. Notably, a decrease in the T helper 1/T helper 2 cell ratio, attributed to reduced Th1 cells and increased Th2 cells, was observed, aligning with the elevated Th2 cytokines. A reduction in plasmatic extracellular vesicular miR-500a levels following glyphosate exposure was found, potentially contributing to the immunological findings. A slight decrease in plasma lipopolysaccharide levels in exposed workers excluded systemic inflammation from increased intestinal permeability but hinted at a possible association with glyphosate-induced microbiota dysbiosis. Since the shikimate pathway, targeted by glyphosate, is also present in Gram-negative bacteria. Overall, these findings suggest that glyphosate can affect the immune system, favoring Th2 responses. While more research is needed to establish causality with the association of glyphosate exposure with the development of allergic reactions in susceptible individuals, our results shed light on potential underlying mechanisms.

Phospholipid composition in small airway lining fluid among tunnel construction workers exposed to respirable crystalline silica

Objective: To explore if the phospholipid composition in the small airway lining fluid differed between a group of tunnel construction workers exposed to respirable crystalline silica (RCS) and a reference group.
Methods: In total, 19 healthy, non-smoking workers under exposure to RCS and 21 unexposed referents from the same construction site were included. The participants underwent a health examination including lung function measurements and collection of exhaled particles (PEx) using the Particles in exhaled air (PExA) method. Analysis of PEx included determination of lipids. In total, 95 lipid species, primarily

phospholipids, were determined. Non-parametric analyses (Wilcoxon rank-sum test and quantile regression), principal component analysis (PCA) and orthogonal partial least squares discriminant analysis (OPLS-DA) were used for data analysis. **Results**: A difference in mol% of phospholipids between the RCS exposed tunnel construction workers and unexposed referents was observed. On lipid class level there was a higher mol% of sphingomyelin (SM) species among exposed workers compared to referents. Regarding single phospholipid species, higher mol % of phosphatidylcholine (PC) and phosphatidylglycerol (PG) species containing diacyl chains with 18:2 (linoleic acid) and 20:4 (arachidonic acid) fatty acid components were observed in the exposed group. Additionally, lower mol% of saturated PC species were observed among the exposed. **Conclusions**: Differences in phospholipid composition in the small airway lining fluid between workers exposed to RCS and a reference group were observed. This indicates a possible impact of RCS exposure on phospholipids in the small airways. However, whether these are linked to health effects is currently not known.

Micronucleus assay in buccal and urothelial epithelial cells of wildland firefighters exposed to wildfire smoke

Occupational exposure as a firefighter is classified as carcinogenic to humans. However, information on the biological effects of wildland firefighting remains limited. This study aimed to assess genotoxicity in a group of wildland firefighters and evaluate the contribution of total concentration of urinary hydroxylated polycyclic aromatic hydrocarbons (ΣOHPAHs) to selected endpoints. A group of 59 northern Portuguese wildland firefighters (mean age: 35.5 ± 9.0 years) was evaluated before and during the wildfire season. Sociodemographic, lifestyle, occupational-related information was collected via questionnaire. The micronucleus (MN) assay in buccal and urothelial cells was applied to paired samples to assess the association with exposure, as indicated by urinary ΣOHPAHs levels. The risk of MN formation in urothelial cells was over twofold higher during the wildfire season [Frequency Ratio (FR): 2.13, 95 % CI: 1.99-2.27, p = 0.01]. A 35 % increase in MN frequency in buccal cells was observed during the wildfire season (FR: 1.35, 95 % CI: 0.76-2.40, p > 0.05). Urinary ΣOHPAHs exhibited a significant positive association with MN‰ in urothelial cells (FR:1.04, 95 % CI: 1.01-1.08, p < 0.05). This study provides the first assessment of MN frequency in urothelial cells of wildland firefighters, offering novel evidence of genotoxic risks and potential long-term health impacts associated with wildland firefighting.

Identifying high-risk workplaces for radon: The role of buildings' foundations and underground water sources

Objective: Radon, a naturally occurring lung carcinogen, can seep into buildings and expose occupants, including workers. Our aim is to describe radon exposure in various workplaces, identify factors associated with exposure, and highlight levers for preventive action. **Material and methods**: Workplaces with an underground or slab-on-grade work area were recruited in four regions of Québec (Central Canada) with high and low potential for radon emissions. Long-term radon samples were taken during the cold season with Alpha Track AT-100 passive dosimeters, deployed by the research team in accordance with Health Canada's Guide for radon measurements in public buildings. **Results**: There were 354 radon measurements in 57 buildings constructed between 1877 and 2021 (54 workplaces), with on average six measurements (1-28) per workplace during a median of 109 days. Ten buildings had all measurements below the detection

limit (15 Bq/m³), and six had at least one measurement above 100 Bq/m³. The highest values recorded were in a fish hatchery (>1500 Bq/m³). Generalized estimating equations revealed that a lowest floor made of materials other than poured concrete, the presence of naturally occurring radioactive material (underground water), and a small building footprint were the most predictive factors of higher concentrations, regardless of the regional radon emission potential. **Conclusion**: In this convenience sample, most workplaces presented radon concentrations well below guidelines. However, the surprise expressed by workplace managers and public health officials regarding high concentrations associated with NORM is evidence of a lack of awareness of the dangers of radon in these environments.

Gravel et al. 2025.
Ecotoxicology and Environmental Safety, vol. 307.
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Keywords: Building materials; naturally occurring radioactive material; occupational exposure; radon; workplace.
Evidence Level: 5B
Link: https://www.sciencedirect.com/science/article/pii/S0147651325017993?via%3Dihub

Biomonitoring of heavy metal exposure and determinants of occupational risk in welders in Arba Minch Ethiopia

Welding activities release potentially toxic elements (PTEs) that pose serious health risks, particularly in developing countries like Ethiopia, where occupational safety is often inadequate. This study assessed heavy metal exposure among welders in Arba Minch Town using fingernail samples. Fingernails collected from 35 welders and 18 non-welders were analyzed for lead (Pb), cadmium (Cd), chromium (Cr), manganese (Mn), copper (Cu), and nickel (Ni) using Atomic Absorption Spectroscopy. Multiple linear regression was used to explore the association between metal levels and factors such as age, work experience, substance use, PPE use, and exposure duration. Welders had significantly higher levels of Pb, Ni, Cu, and Mn ($p < 0.05$) compared to non-welders. Age and work experience were strong predictors of Pb accumulation ($p < 0.01$). Tobacco smoking and khat chewing were associated with elevated Pb, Ni, and Cd levels, whereas regular PPE use was associated with lower Pb and Cu concentrations. These findings accentuate the need for continuous biomonitoring and improved safety practices to mitigate occupational exposure risks among welders in Arba Minch.

Rajamani Sekar et al. 2025.
Scientific Reports, vol. 15, no. 1.
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Keywords: Biomonitoring; Ethiopia; fingernail; heavy metals; occupational exposure; welders.
Evidence Level: 5B
Link: https://www.nature.com/articles/s41598-025-26878-1

Characterizing workplace exposures to nano-TiO2 in Singapore: Potential risks and mitigation strategies

A Objectives: Engineered nanomaterials (ENMs), particularly nano-titanium dioxide (nano-TiO2), are widely used across industries in Singapore, raising concerns about potential worker exposure. This study aimed to quantify occupational exposures and emissions at workplaces handling nano-TiO2, assessing work practices, usage patterns and workplace controls. **Methods**: Occupational exposure to nano-TiO2 was assessed across 7 workplaces (laboratories, manufacturing, downstream application, and recycling). Methods for characterizing personal exposure included personal gravimetric sampling (NIOSH 0600), elemental analysis (NIOSH 7300), and scanning electron microscopy (SEM), while real-time particle number concentration (PNC) monitoring was done to understand the particle distribution in the workplace environment during the tasks performed. Workplace observations included measurement of dimensions of the work area, existing control measures (engineering, administrative, and personal protective equipment), nature of nano-TiO2 handling practices, forms, quantities, particle size, and state changes of the nano-TiO2 used. **Results**: Personal exposure samples were collected from 30 workers across workplaces. These include: 7 in laboratory, 10 in manufacturing, 6 in spraying, and 7 in shredding/recycling. Of these, 3

samples, collected during bulk loading and spraying activities, exceeded the NIOSH recommended exposure limit (REL) for ultrafine nano-TiO2 (0.3 mg/m3). Electron microscopy analysis of the samples exceeding the NIOSH REL for ultrafine nano-TiO2 during spraying revealed that the nano-TiO2 particles were predominantly in the size range of 80 to 147 nm. Respirable dust concentration and PNC were positively correlated for higher-risk activities, with peak PNC observed at the workplaces where spraying applications were performed. **Conclusions**: To our knowledge, this is the first study evaluating nano-TiO2 workplace exposure in Singapore. Exposure levels were generally low, likely due to prevalence of small-scale and research-based applications but varied significantly across workplaces for activities such as spraying, bulk loading and manufacturing. Singapore's current regulatory approach (TR 73) establishes exposure limits but lacks specific guidance on control measures. A more holistic regulatory framework is needed, providing tailored recommendations for diverse workplace exposure scenarios.

Cholinergic dysfunction in occupational manganese exposure

Background and objective: Excessive exposure to manganese (Mn) produces a clinical syndrome of parkinsonism and cognitive impairment. However, our understanding of the mechanisms of Mn neurotoxicity remains limited. This study aimed to evaluate the relationships between Mn exposure, cholinergic function, and cognitive impairment in exposed workers. **Methods**: We assessed brain cholinergic function using vesicular acetylcholine transporter (VAChT) radiotracer (-)-(1-(8-(2-[(18)F]fluoroethoxy)-3-hydroxy-1,2,3,4-tetrahydronaphthalen-2-yl)-piperidin-4-yl)(4-fluorophenyl)methanone (VAT) with positron emission tomography (PET) in 21 Mn-exposed workers. We estimated occupational Mn exposure from work histories and the MRI pallidal index. A cognitive control battery consisting of Verbal Fluency (VF), Letter Number Sequencing (LNS), Two-Back Letter Task (2B), Go-No-Go (GnG), and Simon Task assessed cognitive function. We applied generalized linear models to Mn exposure, voxel-based cholinergic PET, and cognitive control measures, estimating coefficients for cholinergic-mediated associations between Mn and cognitive function. We utilized bootstrapping techniques to validate the mediation coefficients. **Results**: Both Mn exposure metrics were associated with low cholinergic VAT binding in the caudate and cortical regions including the precuneus, pars triangularis, pars opercularis, middle temporal lobe, and entorhinal cortex. Regional cholinergic function mediated the relationship between Mn exposure and both the composite cognitive control score (mean of the 5 cognitive tests) [β = -0.661, 90 % confidence interval (CI) -2.130, -0.032] and the individual VF assessment (β = -0.944, 90 % CI -2.157, -0.065). **Discussion**: Higher Mn exposure is associated with lower cholinergic activity in multiple brain regions. Cholinergic function also mediates a portion of the relationship between Mn exposure and cognitive control performance. Caudate and cortical cholinergic activity may be a biomarker of early Mn neurotoxicity and represent an important mechanism of cognitive dysfunction in Parkinsonian syndromes.

Effects of residual PAH exposure from firefighters' skin and turnout gear on biospecimen microRNA expression

Firefighters are routinely exposed to polycyclic aromatic hydrocarbons (PAHs) during fire suppression activities, molecular biomarkers reflecting such exposure remain underexplored. Thus, we explored an integrated exposure assessment framework linking PAH contamination on turnout gear and skin to changes

in microRNA (miRNA) expression in skin and blood biospecimens. Our goals are to evaluate the relationship between fire-related PAH exposure and miRNA expression profiles in firefighters, and to identify candidate miRNA biomarkers of occupational exposure. This prospective study enrolled 25 firefighters. PAHs on turnout gear and skin were quantified post-fire using gas chromatography/mass spectrometry. Concurrently, skin tape strips and blood were collected and analyzed for miRNA expression using NanoString's nCounter platform. Bioinformatic analyses, including differential expression, pathway enrichment, and network modeling, were performed to evaluate PAH-associated miRNA dynamics. Five miRNAs showed significant differential expression following fire activity ($q < 0.05$), with miR-125a-3p showing a 60 % increase post-fire. Biospecimen comparisons showed six differentially expressed miRNAs, including a 91 % reduction in miR-451a expression in skin relative to blood. Network and pathway analyses identified PAH-specific interaction patterns, with Naphthalene emerging as a central node. Pathway enrichment highlighted necroptosis and Th17 cell differentiation as key biological processes affected by exposure. This study provides novel evidence that PAH exposure at fire scenes induces distinct miRNA expression profiles in firefighters. miR-125a-3p emerges as a potential biomarker responsive to fire-related exposures. These findings provide critical insights into PAH-associated transcriptional responses and suggest the potential of miRNA profiling in occupational exposure assessment and cancer risk stratification among firefighters.

Hwang et al. 2025.

Associations between urinary metabolites of polycyclic aromatic hydrocarbons and liver enzyme levels among Korean firefighters

Objectives: Polycyclic aromatic hydrocarbons (PAHs), byproducts of incomplete combustion of organic compounds, have been linked to various adverse health outcomes; however, evidence associating PAHs with liver damage remains inconsistent. This study aimed to investigate the relationship between PAH exposure and liver enzyme levels among firefighters, who have an increased risk of PAH exposure. **Methods**: A total of 961 firefighters were included in the study. Urinary concentrations of 4 PAH metabolites (2-naphthol, 2-hydroxyfluorene, 1-hydroxyphenanthrene, and 1-hydroxypyrene) were measured and categorized into quartiles. Serum levels of liver enzymes, aspartate aminotransferase (AST), and alanine aminotransferase (ALT) were evaluated. Age, smoking status, alcohol consumption, body mass index (BMI), job position, and self-reported disease history were adjusted as covariates. Multivariable linear regression analyses were conducted to assess the association between PAH metabolites and serum AST and ALT levels. Logistic regression analyses evaluated associations between PAH metabolites and abnormal AST and ALT levels, defined as 40 IU/L or higher. **Results**: Participants in the highest quartile of urinary 2-naphthol had an increased risk of abnormal ALT levels compared to those in the lowest quartile (odds ratio, 2.00; 95% confidence interval, 1.09 to 3.65). No significant associations were observed for the other PAH metabolites. The association between urinary 2-naphthol and abnormal ALT levels did not differ significantly by smoking status, alcohol consumption, or BMI. **Conclusions**: Elevated urinary 2-naphthol levels were associated with abnormal liver enzyme levels among firefighters, suggesting that monitoring and managing PAH exposure may help protect liver health in this occupational group.

Lee et al. 2025.

Occupational radiation exposure of radiologic technologists in Interventional neuroradiology

Purpose: With the rising number of angiographic interventional procedures, occupational radiation exposure is becoming increasingly relevant. As even low doses may contribute to stochastic health effects, enhanced radiological protection measures are warranted. This study aimed to systematically quantify the radiation exposure of radiologic technologists under routine clinical conditions and in an experimental setting. **Methods**: Radiation dose exposure was monitored over one month using three official dosimeters placed at defined locations within the angiography suite, using the floor-mounted C-arm as a reference point. Dose values were extrapolated to estimate annual exposure. Additionally, experimental dose rate measurements were performed at eight locations and three height levels (foot, torso, eye) under standardized conditions using both standard and low-dose DSA protocols. **Results**: Official dosimeter readings averaged less than 2% of the reference value at the C-arm. The extrapolated annual occupational radiation exposure was low (0.44 mSv), with the highest value of 1.03 mSv near the door to the supply room. Experimental measurements revealed average radiation dose rates of 885 µSv/h; with a wide range from: 12 to 6109 µSv/h. Dose rates were more strongly influenced by the shielding effect of stationary protective equipment (reduction factor of 31) than by spatial distance. The highest radiation exposure occurred at foot level. Low-dose protocols reduced ambient radiation by an average of 23%. **Conclusion**: Occupational exposure remained well below legal thresholds but varied spatially. Stationary shielding and low-dose protocols proved most effective for dose reduction.

Sedentary Practices

Metabolic profiling revealed alterations associated with sedentary work in bus drivers

Sedentary behavior in the workplace has emerged as a critical public health concern, with bus drivers representing a high-risk group due to prolonged compulsory sitting. This study aimed to investigate metabolic alterations associated with sedentary work in professional bus drivers compared to active controls. A total of 60 bus drivers and 60 sanitation workers (matched for age, sex, and lifestyle) as controls were enrolled. Fasting serum samples of the subjects were analyzed using ultra-performance liquid chromatography-tandem mass spectrometry (UPLC-MS/MS) for metabolomic profiling. Demographic data and biochemical parameters were also collected. Metabolomic analysis identified 322 metabolites, with 57 differential metabolites (52 up-regulated and 5 down-regulated) in the bus drivers relative to the controls, based on criteria of variable important for the projection value (VIP) ≥ 1, fold change ≥ 1.2 or ≤ 0.83, and $P < 0.05$. Pathway enrichment analysis revealed significant perturbations in metabolic pathways, including valine, leucine and isoleucine biosynthesis; 2-oxocarboxylic acid metabolism; and biosynthesis of amino acids. Additionally, biochemical analysis showed higher triglyceride levels in the bus drivers ($P = 0.037$). These findings highlight distinct metabolic signatures associated with prolonged sedentary work in bus drivers, providing insights into potential mechanisms linking occupational sedentary behavior to adverse health outcomes.

Physical Activity

Strength training intervention for hybrid workers: A randomised pilot feasibility trial

There is a major productivity and economic loss due to poor mental and physical health of the workforce. These factors can be improved by muscle strengthening exercise, which few people currently do. This study investigated the effect of a simple, time-efficient, resistance band training intervention on physical function and work-related outcomes in hybrid-working employees. In this pilot randomised controlled trial, untrained hybrid-working employees were randomised to a four-week resistance band training intervention (15 min 3x per week) or control group. Written and video instructions on the exercises were provided. The primary outcomes were physical function; 30s sit to stand and 30s push-up test, with secondary outcomes of perceived stress, work engagement and productivity. Outcome data was collected via an online survey. Fifty participants (age 46 ± 11 years; 41 female) were recruited to the study, with 46 completing the trial. Compared to the control group, the intervention group (adherence 89%) saw significant improvement in sit-to-stand (mean difference 5.34 ± 7.88 (SD), 95% CI [1.94, 8.75]; p = 0.04) and 30s push-up (mean difference 5.00 ± 3.37 (SD), 95% CI [3.54, 6.46]; p < 0.001) test score. Significant improvements were also found for perceived stress (p = 0.002), total work engagement (p = 0.008) and total productivity (p = 0.004). Four weeks of a simple, time-efficient resistance band training intervention improved lower and upper body physical function, stress, work engagement and productivity. This intervention may be a practical and simple strategy to improve adherence to muscle strengthening guidelines in hybrid working employees, whilst improving physical health and work-related outcomes.

Connelly et al. 2025.
Annals of Work Exposure and Health, vol. 15.
User License: *Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
Keywords: Health promotion; productivity; resistance training; stress; work engagement; workplace.
Evidence Level: 2B
Link: https://www.nature.com/articles/s41598-025-27567-9

Testing the feasibility of 30 min of daily outdoor office work for stress management: A pilot study

Background: Perceived stress in the workplace is a growing concern, with modern office environments often contributing through noise, crowding, and lack of privacy. To support office workers' well-being and recovery during the workday, new ways of working-such as spending time outdoors-are being explored. **Objective**: This explorative pilot study aims to investigate whether engaging in at least 30 min of outdoor office work each day for five consecutive working days could reduce self-rated stress levels among office workers. **Methods**: A within-subjects design was employed. During the first week, eight participants followed their regular office routine. In the second week, the same participants were instructed to spend a minimum of 30 min each day performing office work outdoors. **Results**: In the second week, participants worked outdoors for an average of 322 min per week (≈64 min/day), primarily in urban nature settings. Self-rated stress levels were 15% lower than in the first week, a statistically significant reduction by paired-sample t-test, though not by the Wilcoxon test. **Conclusions**: Daily outdoor work is feasible among office workers and may reduce self-rated stress levels, warranting larger studies with more diverse participants and environments.

Andreasson et al. 2025.
WORK: Journal of Prevention, Assessment & Rehabilitation, vol. 82, no. 4.
User License: *Creative Commons - Attribution-NonCommercial 4.0 International (CC BY-NC 4.0) (https://creativecommons.org/licenses/by-nc/4.0/)*
Keywords: Environmental psychology; health promotion; occupational health; occupational stress; pilot projects; working conditions.
Evidence Level: 3B
Link: https://journals.sagepub.com/doi/10.1177/10519815251356168

Occupational physical activity and incidence and mortality of 14 cancers in 404,249 adults

Leisure physical activity is considered protective against several cancers, but the impact of physical activity at work remains unclear. We analyze data from over 400,000 Norwegian adults followed for a median of 27 years to examine how different levels of occupational physical activity are associated with cancer incidence and mortality. Participants report their typical work activity as sedentary, walking, walking-and-lifting, or heavy labor. Here we show that individuals with more physically active jobs have a lower risk of developing several cancers (i.e., endometrial, colon, breast, rectal, and prostate), and to a lesser extent, the risk of breast cancer mortality. However, occupational physical activity is also associated with increased risk of esophageal and kidney cancer death. These findings suggest that occupational physical activity may lower the incidence of some cancers but are associated with a higher mortality from other cancer types. Understanding these patterns could help tailor public health recommendations related to physical activity and occupational health.

Cadenas-Sanchez et al. 2025.
Nature Communications, vol. 16, 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: Occupational physical activity; mortality; cancers.
Evidence Level: 4B
Link: https://www.nature.com/articles/s41467-025-65326-6

Exploring law enforcement officers' experiences with athletic trainers and work-related injury

Law enforcement is an emerging clinical setting for athletic trainers (ATs), yet little is known regarding law enforcement officers (LEOs) perceptions of the profession. This qualitative study following a general inductive approach explored LEOs' experiences with musculoskeletal injury and their interactions with ATs. Seven officers (N = 7) participated in one-on-one semi-structured interviews. Three themes emerged: (1) roles and responsibilities of ATs, (2) education and training, and (3) impact of injury on LEOs. While participants viewed ATs positively, they demonstrated limited understanding of the profession's scope and expertise. Participants commonly described managing musculoskeletal injuries on their own due to cultural expectations to "push through" pain, limited organizational support, and administrative barriers to care. These patterns reflect broader occupational health and safety concerns within law enforcement and highlight opportunities for ATs to enhance injury prevention and early intervention by promoting a more supportive safety climate and improving access to musculoskeletal care.

Clines et al. 2025.
International Journal of Environmental Research and Public Health, vol. 22, no. 11.
User License: *Creative Commons Attribution (CC BY 4.0) (*https://creativecommons.org/licenses/by/4.0/*)*
Keywords: Health services utilization; injury minimization; musculoskeletal injury; occupational health; police; public safety; tactical athletes.
Evidence Level: 5B
Link: https://www.mdpi.com/1660-4601/22/12/1769

Musculoskeletal Health

Effectiveness and characteristics of work participation interventions for adults with musculoskeletal upper limb conditions: A systematic review

Purpose: To systematically identify and evaluate interventions to improve work participation for adults with upper limb musculoskeletal conditions and explore contextual factors and mechanisms that suggest how the intervention is effective, for whom, and in what setting. **Methods**: The review protocol was pre-registered with PROSPERO (CRD42023433216). Eligible studies met the following criteria. Population adults (aged ≥ 18 years), with musculoskeletal upper limb conditions including traumatic and non-traumatic presentations. Intervention strategies aimed at enhancing work participation. Outcomes measures including return to work, increased work duties or hours, and work functioning. Study design randomised and non-randomised experimental studies, mixed methods, qualitative studies, and case series. Two

reviewers independently screened, extracted data, and completed quality appraisal. Interventions were described using TIDieR and the data presented as a narrative synthesis. **Results**: Twenty-two studies were included. Interventions were categorised into three groups: multimodal or multidisciplinary (n = 13), ergonomic (n = 4), and exercise (n = 5). Eight interventions were primarily delivered in the workplace and 14 in healthcare settings. Four outcome domains were reported: return to work (n = 18), self-reported work function (n = 4), work productivity (n = 5), and work-related costs (n = 2). Only exercise interventions showed consistent statistically significant benefits. Heterogeneity in outcomes prevented formal meta-analysis. Only five studies were rated as high quality. **Conclusions**: There is insufficient evidence to recommend specific work participation interventions for adults with upper limb musculoskeletal systems. No studies explored the impact of Fit Notes or other formal work guidance documentation.

Body mass index and physical training-related injuries in military personnel: A systematic review and meta-regression analysis

Introduction: Discrepancies exist in findings on how varying body mass index (BMI) levels impact physical training-related injuries across different studies. This systematic review and meta-analysis aimed to evaluate the relationship between BMI and physical training-related injuries both qualitatively and quantitatively. **Methods**: A comprehensive search of the MEDLINE, Cochrane and EMBASE databases was performed. The study selection followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. A systematic review and meta-analysis were conducted using weighted data and a random-effects model. Subgroup analyses were based on gender and military service branches. Heterogeneity among the studies was assessed through the I2 statistic, indicating the proportion of total variation in effect size estimates. Funnel plots and Egger's test were employed to assess publication bias. **Results**: 33 studies were included in the analysis, with abnormal BMI (underweight, overweight and obesity) identified as a clear risk factor for training-related injuries (overall RR=1.21, 95% CI 1.15 to 1.27; male RR=1.16, 95% CI 1.08 to 1.23; female RR=1.05, 95% CI 1.02 to 1.09). No significant heterogeneity was observed among navy, army and air force personnel (p=0.58), although abnormal BMI remained a notable risk factor in both the army and air force. Meta-regression analysis indicated that the lowest injury risk occurred at a BMI of 23 kg/m2. Obese individuals under the age of 27 and underweight individuals over the age of 27 were at high risk. Additionally, the highest injury risk was observed during the first 5 months of military training, with a gradual decline in subsequent months, stabilising by the 12th month. **Conclusion**: Findings suggest that abnormal BMI increases the risk of training injuries among military personnel and that this risk varies with age and the duration of training. Emphasis should be placed on risk prevention in the early stages of military training and on enhanced protection for high-risk populations.

Effectiveness of two vocational interventions on sickness absence and costs for people with musculoskeletal disorders: 12 months results from the MI-NAV multi-arm randomized trial

Objectives: This study aimed to assess 12-month outcomes on return to work (RTW) and cost-effectiveness in adults on sick leave due to musculoskeletal disorders who were randomized to either usual case management (UC), UC+motivational interviewing (MI) or UC+stratified vocational advice intervention (SVAI). **Methods**: The study was conducted in the Norwegian Labor and Welfare Administration (NAV). Workers on sick leave due to musculoskeletal disorders for ≥50% of their contracted work hours for ≥7

consecutive weeks were included. Trained case workers delivered MI in two face-to-face sessions, and physiotherapists provided SVAI and identified RTW obstacles. The main outcomes were sick leave days over 12 months and cost-effectiveness, cost-utility and cost-benefit. **Results**: The trial included 509 workers with a mean age of 48 years. There were statistically significant differences between UC+MI versus UC [-15.6 days, 95% confidence interval (CI) -31.0- -0.2], and UC+SVAI versus UC (-17.6 days, 95% CI -33.0- -2.2). Compared to UC, odds ratios (OR) for receiving wage replacement benefits each month were lower for UC+MI (OR=0.73, 95% CI 0.64-0.84), and UC+SVAI (OR 0.74, 95% CI 0.64-0.84). The probabilities of cost-effectiveness were high for adding either MI or SVAI to UC (ceiling ratio 0.90), and the net benefit for MI was €5225 (95% CI -592-10 985) and for SVAI €7214 ((95% CI 1548-12 851) per person. **Conclusions**: Adding MI or SVAI to UC significantly improved RTW outcomes and was cost-effective among people on sickness absence due to musculoskeletal disorders.

Prevalence and factors associated with back pain among education workers in Brazil: A longitudinal study

A This study aimed to longitudinally assess the prevalence of back pain and associated factors in education workers of the Federal Network for Professional and Technological Education in Brazil. This longitudinal epidemiological study was conducted in two stages, with data collected in 2022 and again in 2023, for a sample population of education workers from 38 Brazilian federal institutes. Sociodemographic data as well as data of the back pain assessment performed using the Back Pain and Body Posture Evaluation Instrument questionnaire were collected. Data on the assessment of quality of life and mental health, obtained using the World Health Organization Quality of Life-Bref and Depression Anxiety Stress Scale-21 instruments, respectively, were also collected. Generalized estimating equations were used in a Poisson regression model. Overall, 600 employees from all regions of Brazil were assessed. In 2022, the prevalence of back pain was 80.8%, and it dropped to 78.2% in 2023. The factors associated with a major risk of pain were mainly female sex (relative risk [RR], 1.15; 95% confidence interval [CI], 1.07-1.24), lack of regular physical activity (RR, 1.10; 95% CI, 1.04-1.17), and low quality of life, especially in the psychological domain (RR, 1.13; 95% CI, 1.02-1.27). The results indicate a high prevalence of back pain in education workers of the Federal Network for Professional and Technological Education in Brazil. A survey of associated factors can support a biopsychosocial approach to the problem, with the possibility of preventive actions aimed at reducing the development of pain in education workers, as well as improving their quality of life and occupational health.

Socio-demographic and occupational factors influencing expatriate construction workers' musculoskeletal pain

Musculoskeletal pain (MSP) is a major occupational health problem, and construction workers are particularly at high risk. Understanding the association of MSP with age, body mass index (BMI), smoking status, and job type among these populations can help in designing targeted preventive measures. To investigate the association between MSP and factors such as age, BMI, smoking, and job type among expatriate construction workers in Saudi Arabia. A structured English questionnaire was administered to 175 male expatriate construction workers aged 20-60 years, representing nine job categories. Data were collected on demographics, BMI, smoking status, job type, and MSP occurrence in the past 12 months. Chi-

square tests examined the relationship between age, BMI, smoking, job, and MSP, while logistic regression assessed their predictive influence. The top three nationalities were Indian (40%), Bangladeshi (16.6%), and Jordanian (13.1%). MSP was reported by eighty-five (48.6%) participants. Chi-square analysis revealed no significant associations between age, BMI, smoking, job type, and MSP among the workers (95% CI; p > 0.05). Regression analysis confirmed that none of these factors significantly predicted MSP among the workers. Socio-demographic and occupational factors did not significantly influence musculoskeletal pain (MSP) among expatriate construction workers in Saudi Arabia, suggesting other unmeasured factors contribute to pain risk. Larger, longitudinal studies are needed to identify broader MSP determinants and guide targeted ergonomic interventions. The observational and modestly sized sample (N = 175) may have limited statistical power to detect moderate associations, potentially explaining the non-significant findings.

Alghadir et al. 2025.
Scientific Reports, vol. 15, no. 1.
User License*: Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
Keywords: Construction workers; demographics; expatriate workers; musculoskeletal pain; occupational health; questionnaires; surveys.
Evidence Level: 4B
Link: https://www.nature.com/articles/s41598-025-30549-6

Prevalence and risk factors associated with work-related musculoskeletal disorders among physiotherapists in United Arab Emirates

The rate of work-related musculoskeletal disorders (WRMDs) among hospital workers is approximately twice as high as that in other service industries, making it a significant cause of absenteeism and reduced productivity. The study aimed to determine the severity and extent of WRMDs among physiotherapists in United Arab Emirates (UAE) last 2 years and to specify the specialty area, task, and the most common risk factors for these injuries. Also, to identify the different coping mechanisms the physiotherapist in UAE use to deal with WRMDs. The research was conducted as a descriptive cross-sectional design between March and June 2024. A self-reported questionnaire was distributed among 202 physiotherapists in the UAE who are members of the Emirates physiotherapy society via email. The questionnaire consisted of 17 questions that includes personal and occupational history. The statistically significant was set at a p-value less than 0.05 and 95% confidence interval. 69% of physiotherapists had a WRMDs in one or more area of the body most of the injuries have been occurred in the lower back (38.6%), followed by the neck and shoulders with an equal percentage (28.7%). The highest risk factors in causing the injury were performing repetitive tasks (28.2%) and maintaining a position for a prolonged period (26.2%). With regards to coping, 32% reported utilizing their professional expertise, 40% seek medical assistance to manage their injuries. Approximately 15% preferred to take rest and 13% to do exercise. Based on the findings of this study, physiotherapists in UAE have a high rate of WRMDs attributed to their profession. Survey respondents expressed the need for a change in work habits to reduce the risk of further injuries.

Alshuweihi et al. 2025.
Scientific Reports, vol. 15, no. 1.
User License*: Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
Keywords: Injury; musculoskeletal disorder; physiotherapist.
Evidence Level: 4C
Link: https://www.nature.com/articles/s41598-025-22619-6

Musculoskeletal disorders among office workers: Prevalence, ergonomic risk factors, and their interrelationships

This cross-sectional study investigated the prevalence of work-related musculoskeletal disorders (WMSDs), ergonomic risks, and psychosocial factors among 99 office workers at an industrial company. Participants, aged 20-50 years with minimum one year of experience, were selected using census sampling. Exclusion criteria comprised history of musculoskeletal disorders, fractures, hand surgery, major systemic diseases, pregnancy, menstruation, or recent hospitalization. Data collection utilized the extended Nordic musculoskeletal questionnaire and rapid office strain assessment (ROSA). Results demonstrated 80.81%

WMSDs prevalence, most commonly affecting neck (58.6%), lower back (52.5%), and shoulders (37.4%). The mean ROSA score of 5.40 ± 1.27 indicated suboptimal workstation ergonomics. Significant associations were identified between chair height and knee/shoulder/upper back pain ($p < 0.01$), and between job stress and WMSDs across all body regions ($p < 0.05$). The findings emphasize the necessity of comprehensive interventions targeting ergonomic improvements, postural correction, and stress management to mitigate WMSDs risks in office environments.

Musculoskeletal Health effects of manual sandcrete block handling among construction artisans: Implications for industry practice and training

This study examines the occupational health challenges faced by artisans in Ghana's Ashanti Region. The study employed a purposive sampling technique to select 425 masons through questionnaires. The data collected included workers' mass, block weights, and health problems. The analysis identified fourteen health problems, with headaches, muscle pain, lower back pain, chronic pain, and bruises being most prevalent. Artisan weight negatively correlated with weights of 125 mm blocks ($r = -0.202$, $p < 0.01$) and 150 mm blocks ($r = -0.248$, $p < 0.01$). Additionally, artisan weight showed a negative correlation with working hours (coefficient = -0.133, $p < 0.05$), as did body weight with resting hours (coefficient = -0.217, $p < 0.05$). Higher educational qualifications correlated positively with lifting-related health issues (coefficient = 0.259, $p = 0.000$) and negatively with weather-related issues (coefficient = -0.154, $p = 0.002$). Moreover, the number of working days per week was positively correlated with lifting problems (coefficient = 0.270, $p < 0.05$). The study recommends redesigning block sizes to reduce physical strain. Additionally, policy measures such as reducing machinery import taxes are suggested to encourage mechanisation. The study further emphasises the need for training institutions to incorporate occupational health education into artisan training programs.

From wearable sensor networks to markerless motion capture for instrumental-based biomechanical risk assessment in lifting activities

Manual material handling is one of the leading causes of work-related low-back disorders, and an accurate assessment of the biomechanical risk is essential to support prevention strategies. Despite workers' interest in wearable sensor networks for quantifying exposure metrics, these systems still present several limitations, including potential interference with natural movements and workplaces, and concerns about durability and cost-effectiveness. For these reasons, alternative motion capture methods are being explored. Among them, completely markerless (ML) technologies are being increasingly applied in ergonomics. This study aimed to compare a wearable sensor network and an ML system in the evaluation of lifting tasks, focusing on the variables and multipliers used to compute the recommended weight limit (RWL) and the lifting index (LI) according to the revised NIOSH lifting equation. We hypothesized that ML systems equipped with multiple cameras may provide reliable and consistent estimations of these kinematic variables, thereby improving risk assessments. We also assumed that these ML approaches could represent valuable input for training AI algorithms capable of automatically classifying the biomechanical risk level. Twenty-eight workers performed standardized lifts under three risk conditions. The results showed significant differences between wearable sensor networks and ML systems for most measures,

except at a low risk (LI = 1). Nevertheless, ML consistently showed a closer agreement with reference benchmarks and a lower variability. In terms of the automatic classification performance, ML-based kinematic variables yielded accuracy levels comparable to those obtained with the wearable system. These findings highlight the potential of ML approaches to deliver accurate, repeatable, and cost-effective biomechanical risk assessments, particularly in demanding lifting tasks.

Guiding and Supporting Mental Health and Wellbeing

Mental Health

Digital health interventions for occupational burnout in healthcare professionals: A multi-site randomised non-inferiority trial

Background: Occupational burnout affects between 11 % and 30 % of healthcare professionals and is associated with staff sickness, job turnover, increased costs and poorer quality of care. This study aimed to compare the effects of two theoretically distinctive interventions for burnout in healthcare professionals. **Methods**: This multi-site randomised non-inferiority trial recruited 465 healthcare professionals working across 20 National Health Service (NHS) providers in England. Recruitment took place between October 1, 2020, and June 30, 2021. Participants were randomly assigned to digital health interventions based on cognitive behavioural therapy (CBT; n = 227) or job crafting (JC; n = 238), each of which lasted 6-weeks and involved participation in weekly webinars (1hr) supplemented by online coping skills modules. The primary outcome (Oldenburg Burnout Inventory) was measured at baseline, after 6 weeks, and after 6 months. Between-group differences were compared using analysis of covariance adjusting for baseline measures, testing a non-inferiority hypothesis. **Results**: At 6 weeks, the adjusted mean difference of 0.47 (95 % CI: -0.25 to 1.20; p = .197) in the OLBI favoured CBT. Although this difference was not statistically significant, the non-inferiority hypothesis was not supported based on a pre-specified minimum clinically important difference. At 6 months, the adjusted mean difference favoured CBT indicating superiority; 0.80 (95 % CI: 0.05 to 1.54; p = .036). **Conclusions**: Brief digital health interventions can help to improve occupational burnout and well-being in healthcare professionals. CBT was more effective than JC.

Uncovering mental health profiles of workers with a physically disabling injury or illness using the Complete State Mental Health Framework

Background: Complete mental health encompasses both mental illness (MI) symptoms and positive mental health (PMH). Distinct profiles of MI and PMH have not been explored among injured workers. This study describes latent mental health profiles among workers with a disabling physical work injury/illness and identifies differences in sociodemographic and return-to-work factors, health correlates, and disability claim duration and cost between profiles. **Methods**: 1132 Ontario workers with a physical work-related injury/illness who received lost time claim benefits were surveyed 18 months post-injury. MI was defined by the self-reported presence of a mood and/or anxiety disorder diagnosed by a healthcare professional pre- or post-injury. The Mental Health Continuum Short Form measured aspects of PMH. Claim information was obtained via administrative records. Latent profile analysis identified the unique number of MI and

PMH profiles. Chi-Square and ANOVA tests compared sociodemographic, return-to-work, health, and claim outcomes between classes. **Results**: Four latent MI and three latent PMH classes were uncovered. Eighteen percent of participants exhibited high MI symptoms diagnosed pre- and post-injury and 14% exhibited languishing PMH. Classes with higher MI burden and languishing PMH were more likely to report financial concerns during their claim, pain interference, other health conditions, and opioid use. Claim duration and wage-replacement benefits were ~ 20 days longer and ~ $2000 greater, respectively, among the highest MI and lowest PMH classes. **Conclusions**: Workers' compensation claimants exhibit both flourishing and languishing mental health profiles. The demographic, health, and return-to-work characteristics of latent classes may help identify claimants who may benefit from additional psychological support when returning to work.

Burnout, depression, and medication errors among family physicians

Physician burnout has been recognized as a global healthcare threat. Burnout adversely affects doctors' well-being, patient care costs, and quality. The impact of burnout on medication error is debatable since most literature relied on self-reporting, whereas studies utilizing objective measures reported contrary results. Our study investigates physicians' burnout prevalence and association with detected prescribing errors in ambulatory settings. A cross-sectional study was conducted in 25 primary healthcare centers in Alexandria, Egypt. The Professional Fulfillment Index and Patient Health Questionnaire-9 were used to screen for burnout and depression among physicians. Clinical pharmacists independently reviewed 50 prescriptions per physician to identify decision and process prescribing errors. The prescribing errors were assessed by reviewing drug suitability for the patient's condition according to best practice guidelines. Risk variables for prescribing errors were evaluated using multivariable negative binomial analysis. Researchers collected prescriptions from 118 doctors out of 184 who completed the survey. Almost half of the responders suffered from burnout and depression symptoms (42.39% and 42.93%), while most of them reported low personal professional fulfillment (89.13%). Of 14,121 medications evaluated, 6543 prescribing errors were detected (46.34%), with only 0.11% of them potentially serious. The most prevalent prescribing error types were wrong dosage regimens, incomplete patient information, and missing drug instructions. Analgesics, systemic antihistaminics, and antibacterials were the most misprescribed ATC drug categories. Prescribing errors had no significant association with burnout, professional fulfillment, depression, or thoughts of quitting among doctors. Males, consultants, and rural work settings physicians were more prone to commit ordering errors. Prescribing errors were prevalent in primary care settings, but they were not significantly linked to physicians' burnout, professional fulfillment, or depression. The burden of burnout and depression among physicians, as well as the complexity of evaluating their impact on actual patient safety, highlights the need for further research and tailored interventions.

The effect of teachers' work engagement on burnout: An analysis of the mediation effect of professional identity

The development of the preschool teacher workforce serves as a critical pillar in improving the overall quality of preschool education. However, challenges such as low salaries and inadequate social welfare protections have contributed to widespread burnout among preschool teachers. Burnout is closely linked

to factors such as professional identity and work engagement, both of which play a significant role in shaping teachers' well-being. To better understand the intrinsic mechanisms behind these relationships and identify strategies to reduce burnout, this study conducted a quantitative investigation. A total of 352 teachers from three preschool education groups in Henan Province were surveyed, and structural equation models were constructed using SPSS and AMOS to examine the mediation role of professional identity in the relationship between work engagement and burnout. The findings revealed two key results: (1) Work engagement was positively correlated with professional identity, professional identity was negatively correlated with burnout, and work engagement was also negatively correlated with burnout. (2) Professional identity partially mediated the relationship between work engagement and burnout. These findings provide strong evidence and valuable practical insights for developing targeted interventions to alleviate burnout among preschool teachers, emphasizing the importance of fostering both work engagement and professional identity.

Barriers to mental health treatment in Polish employer-based health plans: Insurance limitations and policy gaps

Objectives: The current employment market faces many challenges, both from the employers' perspective and that of employees. One of the key health challenges is employees' mental health. Poland has over 17.6 million of active workforce, but each year the number of sick leaves due to mental disorders and occupational burnout is rising, and so are the costs. This leads to lower incomes, higher utilization of medical services, higher spending on medications, and higher social transfers, impacting the country's economy and individuals' quality of living. This research aims to present the current market practice, gaps, and limitations in the coverage of mental health services available through employee medical plans, as well as to provide epidemiological characteristics of sick leave due to mental health issues in Poland.

Material and methods: This analysis included general terms and conditions of insurance companies providing employee medical plans (group health insurance) available on their websites. Mental health cover and exclusions of liability were analyzed using 6 different criteria. Epidemiological data on sick leaves (absenteeism) were derived from the annual reports published by the Polish Social Insurance Institution.

Results: All insurance companies introduce strong limitations on mental health cover. The gaps apply to the number of packages that cover consultations with psychologists and psychiatrists, as well as the number and type of visits. Most insurers cover no more than 4 visits with a psychologist and psychiatrist per year, excluding psychotherapy (with 1 exception). The main exclusions of liability include treatment of mental illnesses or behavioral disorders and treatment of addiction. There is no coverage for the costs of medications. **Conclusions**: The offer for mental health treatment through employee medical plans is strongly limited and does not cover the actual needs. Employees must seek treatment through the public sector or pay out of pocket for services with limited income during sick leave. Int J Occup Med Environ Health. 2025;38(6):654-63.

Psychosocial Issues

Self-Efficacy-Based intervention for stress management in health centers employees

Background: Professional occupations for the healthcare workers are usually rife with occupational stress, especially when job demand exceeds the capabilities of the worker and workplace support. The effects of this condition include burnout, low well-being, and low-quality care. Accordingly, using self-efficacy theory of Bandura, the study appraises the impact of self-efficacy-based education intervention on stress management among health center employees of Ramhormoz County in Iran. **Methods**: The quasi-experimental study was conducted on a sample of 103 employees drawn from urban and rural health centers, who were clustered for randomization into an intervention group (n = 49) and a control group (n = 54). The intervention constituted eight weekly 45-minute face-to-face self-efficacy sessions spread over two months. Before and two months after the intervention, data were collected with the Parker and DeCotiis Occupational Stress Questionnaire and the Schwarzer's General Self-Efficacy Questionnaire. Data analyses were conducted using paired, independent t-tests, and Mann-Whitney U-test using SPSS 27; a level of significance was set at $p < 0.05$. **Results**: Before the educational intervention, there were no significant differences in terms of job stress ($p = 0.107$), occupational anxiety ($p = 0.280$), occupational stress ($p = 0.181$), and self-efficacy ($p = 0.176$) between experimental and control groups. But after the intervention, there were significant differences between the groups in terms of job stress ($p = 0.012$), occupational stress ($p = 0.034$), and self-efficacy ($p = 0.038$). No significant difference found in occupational anxiety ($p = 0.473$). **Conclusion**: The effectiveness of the self-efficacy-based educational intervention was evident in its positive effect on stress management and coping techniques among health center employees in the Ramhormoz county. The study emphasized that training in self-efficacy could be beneficial for enhancing self-efficacy and reducing work stress in the interventional group-by linking individual competence to job adoption and stress management. **Trial registration:** This study was registered with the Iranian Registry of Clinical Trials (IRCT), registration number IRCT20211222053487N1, on 2023-09-26.
Saeidavi et al. 2025.

Economic gains from hypothetical improvements in the psychosocial work environment: A cohort study of 71 207 workers in Denmark

Objectives: There is increasing interest in the economic effects of improving working conditions, however, evidence is sparse. This study aims to estimate the economic effects of hypothetical improvements in the psychosocial work environment (PSWE) experienced by Danish workers. **Methods**: We included 71 207 workers, reporting information on their psychosocial working conditions in the "Work Environment and Health in Denmark" survey and linked these workers to population-based register data. We used the parametric g-formula method to estimate the economic effects of hypothetical improvements of the general PSWE, in terms of costs related to sickness absence and healthcare use. We further examined which PSWE factors contributed most to the economic effects. **Results**: A hypothetical improvement of the PSWE - from the least to the most desirable situation - resulted in an annual gain of €1685 [95% confidence interval (CI) €1234-2135] per worker. When analyzing an improvement from the observed to the most desirable situation, the gain became weaker (€305, 95% CI €134-476). Gains were largely driven by reductions in sickness absence and were larger for women than men and for public sector workers than private sector workers. The PSWE factors with the largest contribution were eliminations of threats of violence and improvements in quality of leadership and social support from colleagues (least to most desirable) and improvements in social support from colleagues, influence at work and quality of leadership (observed to most desirable), respectively. **Conclusions**: Hypothetical improvements in the PSWE resulted in substantial economic gains, mostly driven by savings related to sickness absence.

The mediating role of burnout in the association between occupational stress and health-related productivity loss

Occupational stress and burnout are increasingly recognized as major contributors to reduced productivity in modern workplaces. In this study, we explored the association between occupational stress and health-related productivity loss through the mediating effect of burnout syndrome in Korean workers. This study was conducted using a sample of 5,050 participants from 5,553 randomly selected individuals, after excluding those with missing data. The key variables were measured using the Korean Occupational Stress Scale (KOSS® 19), the Korean version of the Burnout Syndrome Scale (KBOSS), and the Korean version of the Work Productivity and Activity Impairment-General Health (WPAI-GH) questionnaire. Statistical analyses were performed using generalized linear models, and mediation analysis. The results revealed a significant association among occupational stress, burnout, and health-related productivity losses. Burnout was found to mediate the relationship between occupational stress and health-related productivity loss, with approximately 51% of the effect being mediated by burnout. Among the burnout sub-dimensions, the mediating effect of exhaustion was the highest. These results suggest that managing occupational stress and burnout can play a crucial role in reducing health-related productivity losses.

Testing psychosocial work adversities as a necessary condition for work-related emotional exhaustion in young workers: A cross-sectional necessary condition analysis on a national general working population-based survey

Objectives: Being exposed to adverse psychosocial working conditions contributes to poor mental health in young workers. This study explores whether psychosocial work adversities are a necessary condition for work-related emotional exhaustion in young workers. **Design**: Data from the 'Netherlands Working Condition Survey 2021' was used. By applying a novel method called Necessary Condition Analysis, we tested two psychosocial work adversities as necessary conditions for high work-related emotional exhaustion in young workers: (1) a composite score of high job demands and low job resources and (2) a composite score of high job demands. Additionally, we tested whether the threshold for job demands as a necessary condition for high work-related emotional exhaustion differed for young workers with low versus high resources. **Setting**: Secondary data analysis on a national working population-based survey. **Participants**: The sample included 5791 young workers in the Netherlands (aged <30 years; 56.8% female). **Primary outcome measure:** Work-related emotional exhaustion. **Results**: A high level of the composite on job demands and job resources is necessary for a high level of work-related emotional exhaustion in young workers (effect size=0.11, p<0.001), and the same applies to the composite score of high job demands alone (effect size=0.10, p<0.001). The necessity threshold for job demands, which guarantees the absence of a particularly high level of work-related emotional exhaustion, was higher for the group of young workers with high job resources compared with young workers with low job resources. **Conclusions**: Both psychosocial work adversities were necessary conditions for high work-related emotional exhaustion in young workers. The necessity threshold for job demands was higher for young workers with high job resources, compared with the group with low resources. This indicates that removing psychosocial work

adversities and ensuring the presence of job resources might contribute to the prevention of high work-related emotional exhaustion in young workers.

Association between resilience, perfectionism and job satisfaction among medical residents in Croatia: A cross-sectional study

Background: Medical residents are among the most vulnerable healthcare workers making their job satisfaction a critical factor influencing mental health, quality of care, and retention. This study examines how resilience and perfectionism are associated with job satisfaction among Croatian medical residents, with particular attention to perfectionism's mediating role in these relationships. **Methods**: In a cross-sectional study, 148 residents (79.1% female; median age 30 years, IQR 29-32) completed an online survey between April and May 2024. Snowball sampling was conducted via closed social media groups for residents. Instruments included validated Croatian versions of the Brief Resilience Scale, the Multidimensional Perfectionism Scale, and the Index of Job Satisfaction. **Results**: Participants were most frequently in their third year of training (Md = 3, IQR = 2-4); the most common specialty was anesthesiology (n = 17). Concern about mistakes, a maladaptive dimension of perfectionism, was negatively correlated with resilience (r = -0.476, p < 0.001) and job satisfaction (r = -0.375, p < 0.001). Regression analysis identified concern about mistakes as the sole predictor of job satisfaction (adjusted R^2 = 0.112). Mediation analysis showed that concern about mistakes partially mediated the relationship between resilience and job satisfaction. Other perfectionism dimensions were not significant predictors. **Conclusions**: This study found that concern about mistakes, a maladaptive form of perfectionism, mediated the relationship between resilience and job satisfaction among Croatian medical residents. Other perfectionism dimensions were not significant predictors. These findings highlight maladaptive perfectionism as a key factor influencing resident resilience and job satisfaction.

Perceived algorithmic control and gig workers' work engagement: Assessing the mediating role of psychological empowerment and the moderating effect of deep acting

Background: Online labor platforms rely on algorithmic control to manage gig work, but its impact on work engagement remains contested. Existing research predominantly adopts technological determinism perspectives, neglecting gig workers' agency, and lacking systematic exploration of motivational mechanisms and emotional resources. Based on Self-Determination Theory, this study examines how perceived algorithmic control influences work engagement through psychological empowerment, with deep acting as a moderator. **Methods**: Data were collected from Chinese gig workers (delivery riders/ride-hailing drivers, N = 392) through snowball and convenience sampling. Established scales measured core variables. Common method bias was tested using SPSS and AMOS, while PLS-SEM analyzed reliability, validity, and hypothesized pathways. **Results**: Perceived algorithmic control positively affects work engagement. Three psychological empowerment sub-dimensions-meaning, influence, and competence-partially mediate relationships between perceived algorithmic control sub-dimensions and work engagement respectively. Deep acting strengthens the positive effect of perceptual algorithm tracking evaluation on influence, and shows highest importance for work engagement but suboptimal performance. Among psychological empowerment sub-dimensions, meaning exhibits the most prominent importance

and requires priority optimization. **Conclusions**: This study transcends technological determinism and validates the positive pathway through which algorithmic control enhances work engagement via psychological empowerment. It reveals meaning construction's central role and deep acting's differentiated moderating effects. Online labor platforms should optimize algorithm design, strengthen meaning perception, reduce ineffective monitoring, implement psychological empowerment incentive mechanisms, provide emotional resource support, and guide deep acting strategies.

Staying motivated by anchoring on values: A mixed methods study on the workplace well-being and addiction beliefs of substance use professionals in Singapore

Purpose: Professionals providing substance use treatment services often report poor workplace well-being. Moreover, professionals' beliefs about addiction may influence their view of clients, treatment delivery and their well-being at work. Most research has been undertaken in Western countries, hence this study investigated workplace well-being and addiction beliefs of substance use (SU) professionals in Singapore. **Methods**: A mixed-methods design was employed. Fifteen participants completed questionnaires related to their well-being at work and addiction beliefs, before participating in a semi-structured interview. **Results**: Descriptive analyses revealed that most participants experienced a moderate level of satisfaction with their work and moderate burnout. Reflexive thematic analysis generated four themes: (1) deriving and maintaining meaningfulness; (2) clarity of role and support for effective performance; (3) holding a multidimensional and nuanced view of addiction promotes satisfaction and motivation; and (4) navigating systemic challenges. Workplace well-being was negatively impacted by perceptions of organisational and systemic challenges. **Conclusions**: SU professionals derived satisfaction and stayed motivated by crafting their work to re-align with their personal values and beliefs, finding role-clarity, adopting a multidimensional and flexible model of addiction and having external support. Implications highlight the role that organisational training, supervision and career development can play in supporting SU professionals.

Am I satisfied with the organization? The moderating effects of organizational career management, altruism and job stress on juvenile criminal justice social workers' job satisfaction

Organizational career management is crucial for employees' promotion, stress resilience, and job satisfaction. However, current research in China has not been sufficiently explored the relationship between organizational career management and job satisfaction among juvenile criminal justice social workers in social work institutions. This study takes organizational career management, job stress, and altruism as predictors of job satisfaction. Based on the Job Demands-Resources Model, a cross-sectional study was conducted among 174 juvenile criminal justice social workers in Zhangzhou City, Fujian Province. Results demonstrate that organizational career management positively influences job satisfaction among this group. Both challenging and hindering stressors reduce job satisfaction, while altruism indirectly enhances job satisfaction by amplifying the effect of organizational career management on work stress. This study provides a new perspective for social work agencies in improving employee job satisfaction and provides new models and insights into the interplay among career management, work stress, altruism, and job satisfaction.

Explainable machine learning for predicting hospital employees' quality of life using psychosocial work environment data

Health-Related Quality of Life (HRQL) embodies the impact of an individual's health on their ability to live a fulfilling life. Quality of Life (QoL) is influenced by a range of factors, including physical functioning and wellbeing, psychological functioning, work environment (WE), lifestyle, and social relations. Various studies have found that job-related factors can be an essential predictor of an individual's HRQL. Furthermore, the Psychosocial Work Environment (PWE) can affect workers' wellbeing and contribute to the company's sustainability. PWE and QoL influence the quality of health services provided by healthcare providers. Therefore, the relationships among QoL, PWE, and healthcare quality need to be assessed to identify factors that improve overall patient healthcare service quality. This relationship has not been extensively evaluated in the Saudi context. Therefore, in the current study, we aimed to employ machine learning (ML) techniques to predict employee QoL using PWE data from a hospital in the Kingdom of Saudi Arabia (KSA). Several ML models have been developed to predict HRQL effectively and their significant attributes; the experiments were carried out with and without feature engineering. The Naïve Bayes (NB) classifier achieved the highest precision of 1.0 (95% CI: 0.81-1.0) in predicting employees' QoL using PWE and demographic variables. The selected Work Environment (WE) features, identified using the Xverse voting selector with the SVM classifier achieved the best results, with accuracy, recall, precision, F1, and receiver operating characteristic (ROC) reaching 0.92 (95% CI: 0.88-0.95), 0.90 (95% CI: 0.86-0.98), 0.95 (95% CI: 0.86-0.99), 0.92 (95% CI: 0.88-0.95), and 0.9, respectively. Post-hoc Explainable Artificial Intelligence (XAI) was used to alleviate the black-box nature of SVM and add transparency to the model. In conclusion, this study provides a robust, explainable tool for predicting employee QoL that can help healthcare organizations improve quality.

Exploring the link between stress and working memory in adults

Background: Working memory (WM) is essential for reasoning, learning, and everyday cognitive tasks and can be influenced by stress. This study investigated the relationship between perceived stress and auditory working memory in 24 adults (16 women, 8 men; median age = 22). **Methods**: Participants completed the Perceived Stress Scale (PSS-10) and a pseudoword span task assessing auditory memory under phonologically demanding conditions. **Results**: Participants with higher stress levels exhibited greater variability and a decline in performance across pseudowords sets, particularly in the final set. Correlational analyses revealed that higher PSS-10 scores were significantly associated with lower accuracy on the most demanding memory set ($r = -0.467$, $p = 0.021$) and with younger age ($r = -0.489$, $p = 0.015$). These findings suggest that elevated stress may impair auditory working memory, with younger adults reporting higher perceived stress. **Conclusions**: This study highlights the importance of considering stress levels in cognitive assessments and supports the hypothesis that stress negatively affects working memory efficiency, particularly in tasks requiring phonological processing.

Fostering Work Participation

Return to Work

Implementing employability interventions for workers with health conditions: A systematic review

Health conditions are a major source of economic inactivity in working age adults. We conducted a systematic review of eight databases to identify factors that influence the implementation of effective interventions for workers with health conditions. We reviewed 55 separate studies of interventions to improve employment and/or health outcomes for workers or those seeking work. Findings were synthesized into evidence-statements (e.g., "Facilitating governance structures are associated with a) efforts at continuation and adaption of interventions and b) learning structures and activities"). The evidence-statements were synthesized into a theory of change to explain the level of implementation of interventions, employment, health, and work performance outcomes. The theory of change considers factors related to: the employing organization's external and internal environment (e.g., labor market legislation), intervention management, intervention features, and a range of stakeholders (e.g., intervention recipients, line managers, health professionals). We identified gaps in the literature, including knowledge of how implementation factors relate to cost-effectiveness and knowledge on how interventions and organizations are adapted to fit with each other. This systematic review is registered on PROSPERO (CRD42024591723).
Daniels et al. 2025.
Social Science and Medicine, vol. 385.

Factors influencing return to work after rotator cuff surgery: A scoping review

Background: Surgical management of rotator cuff syndrome (RCS) is increasingly common in the world. After surgery, the return to work (RTW) process is often difficult for many patients, indicating the presence of factors that facilitate or delay this process. Objective: To identify factors influencing RTW after rotator cuff (RC) surgery. **Methods**: Articles regarding RTW after RC surgery were systematically searched via PubMed, Embase, and ScienceDirect databases. The review was performed according to the Joanna Briggs Institute (JBI) methodology for scoping reviews. **Results**: Of the 323 initial studies, 21 were included in the final analysis. These data represented 5445 patients, the RTW rate was 80.72%, and the time to return was 6.23 ± 1.41 months. Several individual factors are associated with poorer RTW: female sex, dominant limb injuries, surgical complications, and mental health disorders. The workload was the occupational factor with the greatest influence on the RTW process. Heavy manual work and traumatic or load-handling injury had a negative influence, whereas sedentary work, repetitive motion injury and less strenuous work had positive influences. Patients under the workers' compensation system were significantly associated with difficulty returning to work, but their return rates were not different. **Conclusions**: There is no single factor that indicates the success of the RTW process within the evidence analyzed. On the contrary, several patient-related and work-related factors can positively or negatively influence this process. These findings are essential for understanding differences in RTW times among workers and for designing better return strategies.
Lopez 2025.
Work, vol. 82, no. 3.

Return-to-work experiences of individuals with common mental disorders within disability-based insurance systems explored within a mental health recovery framework: A scoping review

Purpose: This study investigates the vocational recovery and return-to-work (RTW) experiences of individuals with common mental disorders (CMDs) within disability-based insurance systems, assessing alignment with the Connectedness, Hope, Identity, Meaning, and Empowerment (CHIME) model. 'Disability-based' refers to systems where eligibility depends on the presence of a health condition regardless of its cause, operating through social insurance in European countries and life insurance in Australia. **Methods**: Through a qualitative scoping review under the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA-ScR) framework we reviewed qualitative peer-reviewed studies on RTW for people with CMDs from five electronic databases and mapped findings to CHIME dimensions noting unclassifiable content. **Results**: Analysis of 11 studies revealed complex RTW processes for individuals with CMDs within disability-based insurance systems, emphasising the importance of CHIME dimensions. Key findings identified the necessity of supportive relationships and structured rehabilitation services for successful vocational recovery. **Conclusion**: Results identify the need for a recovery-oriented approach in occupational rehabilitation for individuals with CMDs. This emphasises the importance of supportive environments that foster empowerment, meaningful engagement, and identity reconstruction in the RTW process. Further research should explore these aspects within the Australian context to develop more effective person-centred rehabilitation models.

Successful strategies for occupational health and safety in small and medium enterprises: Insights for a sustainable return to work

Purpose: The objectives of this paper were to summarize successful strategies in occupational health and safety (OHS) management in small and medium-sized enterprises (SMEs) and to explore their potential applicability for disability management (DM) and return-to-work (RTW) after work-related injuries.
Methods: A scoping review was conducted, using a consensus-based iterative approach, and a consultation with stakeholders. Twelve databases were searched in collaboration with a specialized librarian, using keywords and combinations of terms. The reviewers identified pertinent articles, selected those which corresponded to the inclusion criteria, extracted data, and analyzed information using qualitative content analyses. A synthesis was presented to the stakeholders, and their comments on overall applicability of these strategies in the Quebec context of DM and RTW were detailed. **Results**: A total of 638 references were retrieved from all sources, resulting in 37 scientific articles being analyzed. Four main strategies for improving OHS management in SMEs were identified: dissemination and exchange of information; transmission and acquisition of knowledge, skills, and abilities; using a participatory and collaborative approach; and considering the organizational context. Even if DM and sustainable RTW were sometimes mentioned by authors as important for OHS management in SMEs, specific strategies and implementation elements were not actually described by authors. However, different resources, structures, and activities, associated with one or more of the OHS management strategies described, through their different interactions between the various stakeholders, seem having the potential to act also in sustainable RTW.

Conclusion: This review has provided an overview of strategies deployed to improve OSH in SME. The results invite stakeholders to a deep reflection on the potential application of such strategies to encompass sustainable RTW in SMEs.

Negative beliefs about working with health problems and support at work as predictors for return to work for people struggling with common mental disorders

Purpose: The purpose of this study was to investigate predictors for return to work for people struggling with common mental disorders on sick leave or at risk of sick leave. The first aim of this study was to evaluate the psychometric properties of a set of statements exploring different conditions at the workplace and assumptions about working with health problems, by investigating the factor structure, reliability and construct validity of these statements. The second aim of this study was to investigate the predictive value of the identified factors. **Methods**: A total of 797 patients from an outpatient mental health clinic were included in a naturalistic observational study. The study design was longitudinal. The participants filled out self-report questionnaires pre- and post-treatment. **Results**: A principal component factor analysis with a varimax rotation identified two factors, Negative beliefs about working with health problems and Support at work, displaying high internal consistency, 0.83 and 0.84, respectively. Separately, both factors were significant predictors of full return to work after treatment. The final multivariable analysis including both factors left Negative beliefs about working with health problems as a significant predictor explaining unique variance. **Conclusions**: Negative beliefs about working with health problems and Support at work are important predictors for work status after treatment and should therefore be addressed during treatment for common mental disorders to assist people return to work.

Gender differences in employment disruption and return to work among cancer survivors in South Korea

Purpose: This study analyzes gender differences in unemployment and return-to-work experiences among all patients with cancer in a nationwide cohort. **Methods**: Using data from the Korean National Health Insurance Service (NHIS), we analyzed 20,835 employed individuals (aged 15-59) newly diagnosed with cancer in 2010. These individuals were followed annually for 6 years (2010-2016) to assess unemployment after diagnosis. Of the total, 5,524 patients experienced unemployment during the follow-up period. Kaplan-Meier survival curves and Cox proportional hazards models were used to evaluate unemployment risk and its association with gender. **Results**: The hazard ratio (HR) for unemployment following cancer diagnosis is 1.98 (95% CI, 1.85 to 2.11), indicating that women have a higher rate of job loss compared to men. Additionally, women were approximately 26% less likely to return to work after losing their jobs, highlighting significant gender disparities in employment outcomes among cancer survivors.

Conclusion: Employment is important for cancer survivors, but women are more vulnerable to job loss after a cancer diagnosis and less likely to return to work after losing their jobs, particularly those in lower-income groups.

Timelines and associated factors for return-to-work of patients with painful lumbar radiculopathy who undergo lumbar microdiscectomy followed by physiotherapy: A prospective cohort study

Study design: Prospective cohort study with a 52 weeks follow-up. **Objective**: Medical absenteeism in patients with painful lumbar radiculopathy undergoing lumbar microdiscectomy followed by physiotherapy is associated with high socioeconomic costs. We lack good quality information about the time to return-to-work and the factors associated with returning-to-work in this patient group. The objective of this study is to describe the probability of return-to-work and explore associations between routinely collected preoperative factors and return-to-work for patients with painful lumbar radiculopathy undergoing lumbar microdiscectomy and postoperative physiotherapy. **Materials and methods:** We included 257 patients with clinical signs and symptoms of painful lumbar radiculopathy in whom nerve root compression was confirmed by magnetic resonance imaging, and who underwent microdiscectomy and postoperative physiotherapy. Time to return-to-work was evaluated using Kaplan-Meier survival analysis. The association between independent factors and return-to-work was examined through Cox regression analysis.
Results: Full resumption of their original paid job (i.e. same role with the same physical demands and responsibilities) occurred in 178 (69.3%) of participants by 52 weeks. In these patients, the median (IQR) return-to-work time was 16 weeks (14-16), with 85.0% of patients resuming work within 26 weeks. Higher education (HR=1.82), self-employment (HR=1.84), and the absence of predominant physical work (HR=1.61) were significantly associated with a faster return-to-work, while higher disability scores negatively impacted return-to-work time (HR=0.56). **Conclusion**: At 52 weeks following lumbar microdiscectomy and postoperative physiotherapy for painful lumbar radiculopathy, approximately two-thirds of individuals returned to work in their original roles, while some transitioned to different roles. Work-related and personal factors play a key role in determining the timing of this return. Recognizing these predictors in clinical practice can help surgeons, physiotherapists, and occupational health professionals guide patient expectations, provide more individualized workplace counselling, and support realistic, timely, and sustainable work reintegration.

Earlier orthopaedic surgeon evaluation of Workers' Compensation associated with higher return to full duty after shoulder arthroscopy

Purpose: To analyze if earlier orthopaedic evaluation (within 100 days of injury) is associated with a greater full duty return to work for shoulder arthroscopy patients with active workers' compensation (WC) claims. **Methods**: This was a retrospective chart review of all patients with an active WC claim treated with arthroscopic shoulder surgery at a community hospital between 2011 and 2018 and for 2 years postoperatively. The WC patients were divided into two groups: early orthopaedic evaluation (evaluated within 100 days of injury) and delayed orthopaedic evaluation (evaluated greater than 100 days after injury). Outcomes evaluated were rate and time until full duty return to work. **Results**: Final inclusion yielded 59 patients (36 early orthopaedic evaluation and 23 late orthopaedic evaluation). There was a higher rate of return to full duty in early versus late orthopaedic evaluation, 26 of 36 (72%) versus eight of 23 (35%), respectively (P = 0.005). A strong correlation was identified between time until orthopaedic evaluation and time to return to full duty after injury (r = 0.519, P = 0.002). Late orthopaedic evaluation was

associated with a 4.89 times increased odds of not returning to full duty (odds ratio = 4.89, 95% confidence interval = [1.6 to 14.9]). **Conclusion**: Earlier Orthopaedic Surgeon evaluation of WC patients with shoulder injuries was associated with a higher return to full duty after shoulder arthroscopic surgery.

Patients' perspectives of receiving an early vocational rehabilitation following major traumatic injury

Purpose: Return to work (RTW) after a major traumatic injury (MTI; traumatic brain injury, spinal cord injury, multi-trauma orthopaedic injury) is an important rehabilitation outcome. This study aimed to explore the experience of early vocational rehabilitation (EVR) after MTI, and RTW barriers/facilitators. **Methods**: Adopting a qualitative design, 24 people with MTI were interviewed about participating in the Early Intervention Vocational Rehabilitation Service (EIVRS). Perceptions of EIVRS timing and RTW barriers/facilitators were explored. Data were analysed using reflexive thematic analysis. **Results**: Participants experienced EIVRS as positive. The intervention's early timing was mostly appropriate, determined by individual factors. RTW barriers included injury impairments; difficulties adapting work roles and unstable employment; and psychological difficulties. RTW facilitators included ongoing recovery, employer flexibility, and feeling supported. Reported EIVRS benefits centred around three themes: gaining optimism and motivation through increased understanding; having a sense of control through the individualised program and vocational expertise; and feeling less worry and stress. Participants recommended long-term EIVRS availability. **Conclusions**: Participants experienced EIVRS as an important component of their rehabilitation. Timing of vocational interventions needs to be individualised according to medical, cognitive, psychological, and employment factors. Embedding EVR within rehabilitation teams would facilitate this individualisation and may improve long-term rehabilitation outcomes.

Facilitators and barriers to mental health leaves and return to work among Canadian teachers

In our qualitative study, we interviewed 45 Canadian teachers about mental health issues, taking a leave of absence, and their subsequent return to work. We found that doctors, supportive principals, supportive colleagues, supportive human resource departments, supportive school boards, and the teaching unions were facilitators for taking a leave, while stigma, unsupportive administration, preparation, and the process of taking a leave were barriers. In returning to work, principals and administrators, and preparation to return were cited as barriers, while colleagues, principals and administrators, doctors, unions and a change in work were facilitators. We interpret these findings through a synthesized framework combining Allegro and Veerman's theory of sickness absence and D'Amato and Zijsrtra's theory of work resumption, highlighting individual, organizational, and societal factors shaping leave and return decisions. With the high cost of teacher absences and critical staffing shortages, we discuss the impacts of these facilitators and barriers and make recommendations for practice for a healthy teaching workforce.

Individual placement and support and participatory workplace intervention for people with work disabilities: Experiences of job coaches

Background: This study investigates the experiences and satisfaction of job coaches with Individual Placement and Support (IPS) and Participatory Workplace Intervention (PWI) for enhancing work participation of people with work disabilities. **Methods**: Barriers and facilitators for execution and the satisfaction of job coaches were explored in focus groups, supported by additional insights from field notes. Focus group data was transcribed verbatim and analysed using thematic analysis. **Results**: Job coaches were satisfied with IPS, and a main facilitator was their belief in its effectiveness, especially regarding the 'first place, then train' principle. The biggest barrier to carrying out IPS according to protocol was the integration with healthcare. Job coaches were satisfied with how PWI ensured a client's input in the conversation with employers, however, PWI was often not carried out due to barriers concerning e.g., time investment. **Conclusions**: Multiple barriers for the execution of IPS and PWI were identified. However, job coaches expressed satisfaction with (elements of) these interventions. Further research is warranted to address these barriers and improve implementation.

Presenteeism and Absenteeism

Psychological distress and productivity loss: A longitudinal analysis of Australian working adults

By 2030, it is anticipated that poor mental health will cost the global economy approximately $6 trillion per year, primarily due to productivity loss. It is crucial to understand how psychological distress contributes to productivity loss in the workplace. We aim to investigate the relationship between psychological distress and productivity loss in the Australian working population. We utilized eight waves of longitudinal data drawn from the Household, Income, and Labour Dynamics in Australia (HILDA) Survey (waves 7, 9, 11, 13, 15, 17, 19, and 21). We compiled an unbalanced panel data set comprising 70,973 person-year observations from 18,729 unique working adults. We used Fixed-effects Poisson regression and Fixed-effects logistic regression models to investigate the within-person differences in the relationship between psychological distress and productivity loss (measured through sickness absence, presenteeism, and underemployment). We found that moderate and high psychological distress is associated with a higher rate of sickness absence, presenteeism, and underemployment when a working adult shifted from low psychological distress after controlling socio-demographic, health, and employment-related characteristics. Our study demonstrated that moderate to high psychological distress adversely affected employees' job productivity through increased sickness absence, a higher likelihood of presenteeism, and greater levels of underemployment. Our findings also revealed that employees with moderate and high psychological distress incurred additional annual sickness absence costs of AUD 60.66 and AUD 99.26, respectively, compared to peers with low psychological distress. Additionally, our study found that employees with

moderate and high levels of psychological distress experienced significantly higher levels of presenteeism, which resulted in additional annual costs of AUD 1,166.30 and AUD 3,656.05, respectively, compared to their counterparts with low psychological distress. Psychological distress imposed significant costs on Australian workplaces. Implementing workplace health promotion programs should be prioritized as a policy to address psychological distress among employees, enhance their well-being, and improve overall productivity.

Keramet et al. 2025.
The European Journal of Health Economics, vol. 26, no. 8.
User License*: Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
Keywords: Absenteeism; Australia; presenteeism; productivity loss; psychological distress; underemployment.
Evidence Level: 4A AU
Link: https://link.springer.com/article/10.1007/s10198-025-01764-9

Sleep and work productivity loss in multiple sclerosis: An Australian study

Background: People with multiple sclerosis frequently experience poor sleep quality and work productivity loss, both impacted by MS symptoms. **Objectives**: This study examined associations between sleep measures (sleep quality and daytime sleepiness) and work productivity loss, and the mediating effects of other MS symptoms. **Methods**: Participants (N = 526) were from the Australian Multiple Sclerosis Longitudinal Study. The Work Productivity and Activity Impairment MS version questionnaire was used to measure MS-related work productivity loss. Cragg hurdle regression was used to examine associations. **Results**: The prevalence of any work productivity loss was higher among poor sleepers (59.7 %) compared to good sleepers (34.4 %). Worse sleep quality (β=2.9, 95 % CI [1.9,3.8]) and greater day time sleepiness (β=2.1, 95 % CI [1.4, 2.8]) were associated with total work productivity loss. Both sleep measures were associated with both presenteeism and absenteeism, with stronger associations seen for presenteeism. MS symptoms mediated these associations, with the cluster of 'fatigue and cognitive symptoms' being the strongest mediator. **Conclusions**: Poor sleep quality and high levels of daytime sleepiness are associated with work productivity loss, and mediated by MS symptoms. Targeted management, prioritising those with worse sleep quality and greater daytime sleepiness, may help improve work productivity, either directly or indirectly via improvements in MS symptoms.

Dagnew et al. 2025.
Multiple Sclerosis and Related Disorders, vol. 103.
User License*: Creative Commons Attribution (CC BY 4.0) (https://creativecommons.org/licenses/by/4.0/)*
Keywords: MS symptom; Multiple Sclerosis; productivity; presenteeism; sleep.
Evidence Level: 4A AU
Link: https://www.msard-journal.com/article/S2211-0348(25)00480-8/fulltext

Occupational prestige and future sickness absence and disability pension in women and men: A Swedish nationwide prospective cohort study

Background: Little is known about associations between occupational prestige, that is, the symbolic evaluation and social positioning of occupations, and sickness absence (SA) or disability pension (DP). We explored whether occupational prestige was associated with future SA or DP among women and men. **Methods**: A Swedish 4-year prospective cohort study of all those in paid work and aged 25-59 in 2010 (N = 2,605,227; 47% women), using linked microdata from three nationwide registers and Standard International Occupational Prestige Scale values, categorised as 'very low', 'low', 'medium', 'high', or 'very high'. Odds ratios (ORs), 95% confidence intervals (CIs), crude and adjusted for several sociodemographic factors, were calculated for three outcomes: at least one SA spell (>14 days), >90 SA days, or DP occurrence, during follow-up (2011-2013). **Results**: The mean number of SA days in 2010 varied by occupational prestige group, for example, 'very high': 3.0, 'very low': 6.5. Compared to those in occupations with 'very high' prestige, all other groups had higher adjusted ORs for all three outcomes. Among men, those with 'very low' occupational prestige had the highest OR for at least one SA spell: OR 1.51 (95% CI 1.47-1.56); among women, the 'medium' group had the highest OR: 1.30 (1.27-1.32). The results were similar for SA >90 days. OR for DP among women with 'very low' occupational prestige was 2.01 (1.84-

2.19), and 3.55 (3.15-4.01) for men. **Conclusions**: Working in lower occupational prestige occupations was generally associated with higher odds of future SA/DP than working in higher prestige occupations; these associations were stronger for men than for women.

Hensing et al. 2025.
Scandinavian Journal of Public Health, vol. 53, no. 7.
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Keywords: Occupational prestige; disability pension; sick-leave.
Evidence Level: 4B
Link: https://journals.sagepub.com/doi/10.1177/14034948241272936

Risk factors for long-term sickness absence in patients with high-impact chronic pain: A scoping review and Swedish register-based cohort study

High-impact chronic pain (HICP) affects 8% of individuals worldwide. Beyond its direct consequences, HICP increases the risk of long-term sickness absence (LTSA), leading to income loss and increased societal costs. Prevention is essential and understanding risk factors for LTSA is a critical first step. We conducted a joint scoping review and Swedish register-based cohort study, to first identify and subsequently analyze potential risk factors. A multivariable logistic regression model estimated the association between the risk factors and LTSA, defined as >180 sickness absence days in the third year after specialist healthcare entry. The likelihood ratio chi-square test determined each factor's contribution to model fit. Associations were reported as marginal risk ratios (mRR) with 95% confidence intervals (95% CI), comparing the 75th to the 25th sample percentiles. Of 57 identified risk factors, 34 were analyzed in a sample of 10,552 patients, 25% of whom experienced LTSA. Seven risk factors contributed significantly at a Bonferroni-adjusted alpha level: prior sickness absence, (mRR: 2.53; 95% CI: 2.40-2.66), comorbid neurological disorders (1.60; 1.38-1.81), self-rated work ability (1.42; 1.29-1.58), confidence in recovery (1.21; 1.13-1.30), female sex (1.18; 1.10-1.26), pain duration (1.11; 1.03-1.20), and household income, which showed a complex non-monotonic relationship. In line with previous research, the strongest association was with prior sickness absence. By targeting the aforementioned risk factors, workforce reintegration could be facilitated for individuals with HICP. PERSPECTIVE: Our scoping review and large sample Swedish register-based study identifies and quantifies key risk factors for long-term sickness absence in individuals with high-impact chronic pain, providing a foundation for early identification and targeted rehabilitation, which in the longer perspective could support workforce reintegration and reduce individual suffering and societal costs.

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Association of severity of premenstrual disorders with absenteeism and presenteeism among Japanese working women: A cross-sectional study

Premenstrual disorders (PMDs) in working women are reported to be associated with absenteeism and presenteeism, but few studies have considered their severity from a broad range of manifestations and investigated its impact on absenteeism and presenteeism simultaneously within the same population consisting of various occupations. Thus, we conducted a cross-sectional study of 2,987 premenopausal women working across Japan using a self-administered survey that included items on absenteeism and presenteeism due to premenstrual symptoms and symptom severity. Multivariate analyses were used to examine the association between PMD severity, absenteeism (being away from work) and presenteeism (decreased work performance). Results demonstrated that PMD severity was strongly associated with both absenteeism and presenteeism irrespective of age, socioeconomic background, and work-related factors. Those with moderate to severe forms of PMDs had a two-fold risk of absenteeism and 18-30% worse presenteeism compared to a milder group. Furthermore, two-thirds of women with severe PMDs reported ≥30% performance reduction without absenteeism, indicating that the impact of PMDs was more significant for presenteeism than absenteeism. Our study results suggest the importance of widely

promoting education and treatment of PMDs regardless of sociodemographic factors and working conditions for securing the workforce through the advancement of working women.

Line manager perspectives on workplace-based efforts to reduce sickness absence: A qualitative study

Introduction: The purpose of this study is to examine line manager perspectives on two workplace-based efforts to reduce sickness absence (uniform procedures for managing sickness absence and initiating preventive actions), two components from an intervention to reduce sickness absence in public sector workplaces in Denmark. **Methods**: We performed 19 semi-structured interviews with line managers from four public sector workplaces. The interviews were analysed using thematic analysis (TA). Normalization Process Theory (NPT) was used as theoretical framework. **Results**: Uniform sickness absence procedures are meaningful and provide clear expectations for line managers and employees about roles and responsibilities during sick leave. Line managers expressed a desire for flexibility in adjusting the procedures to the individual needs of the employees. They also reported a need for proactive preventive actions that prevent sickness absence from occurring in the first place. The line managers reported lacking competencies to ensure appropriate sick leave management and that their own well-being was often overlooked. **Conclusion**: Future interventions should focus on improving the work environment instead of focusing solely on absenteeism. It is essential to consider the well-being of the line managers and provide adequate training, as this can affect their capability to ensure the well-being of, and reduce sickness absence, among their employees.

Identifying risk factors of long sickness absences: A registry-based study using explainable AI methods

Objective: To identify and explore variable groups and individual predictors of long sickness absences outside of well-known predictors such as service use and previous sickness absence using machine learning, explainable artificial intelligence methods and a submodel approach. **Design**: Retrospective study of prospectively collected registry data on sickness absences and a questionnaire used in health examinations. **Setting**: Electronic medical record data of one large occupational health service provider in Finland. **Participants**: 11 533 employees of various occupations who, between 2011 and 2019, had at least once **completed** a health questionnaire that could be linked to service usage data and who had not had their initial health check within 1 year before or 3 months after completing the questionnaire. **Primary outcome measures:** To identify predictors of at least one long sickness absence period (≥30 days) during a 2-year follow-up. **Results**: The highest area under the receiver operating characteristic curve (AUROC) values among the submodel groups were for the sickness absence and service use submodels (0.68-0.74). The AUROC values for the submodels of sociodemographic factors, health habits or diseases data category ranged from 0.55 to 0.67 and from 0.55 to 0.67 for the submodels of questionnaire data. The AUROC value of the ensemble model that combined all submodels was 0.79 (95% CI 0.788 to 0.794).The most important factors predicting long sickness absences based on the submodels were reported pain, number of symptoms and diseases, body mass index and short sleep duration. Additionally, several work and mental

health-related variables increased the risk of long sickness absence. **Conclusions**: Other variables besides service use and sickness absence increase the accuracy in predicting long sickness absence and providing information for planning interventions that could have a beneficial impact on work disability risk.

Workers Compensation

Machine learning-based prediction of dissatisfaction after occupational injury: A retrospective cohort study using the nationwide Korean workers' compensation insurance database

Objectives: To develop a machine learning (ML)-based predictive model to determine the key predictors of dissatisfaction after occupational injury (OI). **Design**: A retrospective cohort study. **Setting:** Nationwide 5-year panel data (2018-2022) from the Panel Study of Workers' Compensation Insurance in South Korea. **Participants**: A total of 2298 workers who completed compensation-related medical care in 2017. **Methods**: Predictive modelling was conducted with extreme gradient (XG) Boost, light gradient boosting machine (GBM), CatBoost and random forest. SHapley Additive Explanations (SHAPs) analysis was conducted to interpret the feature importance. Further, logistic regression was conducted for comparison. **Primary outcome measures**: This study evaluated postinjury satisfaction among workers using survey items associated with satisfaction levels. We adopted a 5-year follow-up period. **Results**: Of the 2298 participants, 570 were dissatisfied. The logistic regression model indicated that dissatisfaction was significantly associated with unemployment (adjusted OR (aOR) 1.701; 95% CI: 1.296 to 2.233), lack of private health insurance (aOR 1.347; 95% CI 1.042 to 1.741) and lower perceived socioeconomic status (aOR 2.097; 95% CI 1.109 to 3.965). Among the ML models, light GBM exhibited the highest area under the receiver operating characteristics curve (0.770 (95% CI 0.718 to 0.819)), followed by CatBoost (0.768 (95% CI 0.718 to 0.815)), random forest (0.766 (95% CI 0.715 to 0.814)) and XGBoost (0.765 (95% CI 0.717 to 0.811)). The SHAP analysis demonstrated the total number of household members, extent of pain interference with daily life, perceived health status before injury and financial factors as the strongest predictors. **Conclusion**: This study developed and demonstrated robust predictive performance of an ML-based model for determining dissatisfaction after OI. The key features included employment status, financial stability, chronic pain and cognitive function, highlighting the multifaceted nature of worker satisfaction.

Working hours

The dose-response relationship between working hours and prevalence of hypertension in construction workers: Evidence from Wuhan, China

Background: The rapid urban expansion and renewal in China have increased the workload and work intensity for construction workers. Prolonged work hours prevent these builders from having adequate recovery time, which may be associated with higher susceptibility to occupational injuries and chronic diseases. This study aimed to explore the dose-response relationship between weekly working hours and hypertension among construction workers. **Methods**: A cross-sectional study was carried out from June to July 2022 in Wuhan, China. A stratified cluster random sampling method was used, and all construction workers at their respective construction sites were invited to participate. Unconditional logistic regression

and restricted cubic spline (RCS) models were utilized to evaluate the dose-response relationship between weekly working hours and hypertension. Subgroup and sensitivity analyses were conducted to assess the robustness of the results. **Results**: A total of 750 construction workers were included in our study, and the prevalence of hypertension among them was 18.00%. Workers with hypertension reported longer weekly working hours (67.64 ± 12.70 h/week) than those without hypertension (59.72 ± 12.81 h/week). The likelihood of having hypertension was found to be 4.22 (95% CI = 2.10-8.49) times higher for those in the Q3 group and 4.90 (95% CI = 2.26-10.64) times higher (66-70 h/week) for those in the Q4 group (71-140 h/week) compared to the Q1 group (10-54 h/week). The RCS analysis showed a non-linear dose-response relationship between weekly working hours and hypertension (P non-linear < 0.05), and the results were consistent across subgroups. **Conclusion**: In this cross-sectional study, longer weekly working hours were associated with higher odds of hypertension among construction workers.

Effects of long working hours on metabolic dysfunction-associated steatotic liver disease, with and without increased alcohol intake, in healthy workers: A 10-year cohort study

Objectives: To develop a machine learning (ML)-based predictive model to determine the key predictors of dissatisfaction after occupational injury (OI). **Design**: A retrospective cohort study. **Setting**: Nationwide 5-year panel data (2018-2022) from the Panel Study of Workers' Compensation Insurance in South Korea. **Participants**: A total of 2298 workers who completed compensation-related medical care in 2017. **Methods**: Predictive modelling was conducted with extreme gradient (XG) Boost, light gradient boosting machine (GBM), CatBoost and random forest. SHapley Additive Explanations (SHAPs) analysis was conducted to interpret the feature importance. Further, logistic regression was conducted for comparison. **Primary outcome measures:** This study evaluated postinjury satisfaction among workers using survey items associated with satisfaction levels. We adopted a 5-year follow-up period. **Results**: Of the 2298 participants, 570 were dissatisfied. The logistic regression model indicated that dissatisfaction was significantly associated with unemployment (adjusted OR (aOR) 1.701; 95% CI: 1.296 to 2.233), lack of private health insurance (aOR 1.347; 95% CI 1.042 to 1.741) and lower perceived socioeconomic status (aOR 2.097; 95% CI 1.109 to 3.965). Among the ML models, light GBM exhibited the highest area under the receiver operating characteristics curve (0.770 (95% CI 0.718 to 0.819)), followed by CatBoost (0.768 (95% CI 0.718 to 0.815)), random forest (0.766 (95% CI 0.715 to 0.814)) and XGBoost (0.765 (95% CI 0.717 to 0.811)). The SHAP analysis demonstrated the total number of household members, extent of pain interference with daily life, perceived health status before injury and financial factors as the strongest predictors. **Conclusion**: This study developed and demonstrated robust predictive performance of an ML-based model for determining dissatisfaction after OI. The key features included employment status, financial stability, chronic pain and cognitive function, highlighting the multifaceted nature of worker satisfaction.

Association between daily long working hours and actigraphic sleep, vigilance, blood pressure and psychological responses: A 10-day observational study among Japanese daytime workers

Objectives: This study examined the association between daily long working hours (LWHs) and diverse health-related outcomes, using objective and subjective measures. It further evaluated the specific durations of daily LWHs that may be considered inappropriate in cases with adverse health effects. **Methods**: 98 employees participated in a 10-day observational study. Participants self-reported their daily working hours, subjective states and performed the measurement of blood pressure (BP) and psychomotor vigilance test (PVT) immediately on waking and before bedtime. Objective sleep was recorded nightly using actigraphy. Linear mixed model (LMM) analysis was performed. **Results**: LWHs were significantly associated with higher systolic BP (β=0.65), greater fatigue (β=1.79) before bedtime, shorter total sleep time (TST; β=-0.09) and higher systolic BP (β=0.76) on waking (all p<0.05). Reduced TST was significantly linked to slower PVT reciprocal response time (β=0.03), higher lapse (β=-1.10) and greater sleepiness (β=-0.20) after waking (all p<0.05). Categorical LMM analysis revealed that working >12 hours was significantly associated with increased fatigue before bedtime, whereas working >13 hours significantly reduced TST compared to working ≤9 hours. Sleeping <6 hours caused significantly poorer PVT outcomes, and sleeping <5 hours caused significantly stronger sleepiness after waking than sleeping ≥7 hours. **Conclusions**: Daily LWHs and consequent reductions in sleep duration were associated with adverse outcomes. These findings underscore the importance of daily management of work hours and adequate sleep duration to prevent excessive workload and promote recovery from occupational demands.

Wellness Programs

Effectiveness of occupational health promotion programs on cardiometabolic risk factors: A systematic review and three-level meta-analysis

Background: This study aimed to evaluate the effectiveness of workplace-based health promotion programs targeting cardiometabolic risk factors. **Methods**: We conducted a systematic review and three-level random-effects meta-analysis following PRISMA guidelines, covering studies published from January 2019 to September 2024. Eligible studies included randomized controlled trials (RCTs) and quasi-experimental (QE) designs assessing workplace interventions to reduce cardiometabolic risks in adult workers. Twelve outcomes were considered. Subgroup analyses and meta-regressions were performed to explore sources of heterogeneity. Certainty of evidence was evaluated using GRADE assessment tool. **Results**: Forty-four studies (30 RCTs, 14 QE) involving 49,813 participants were included. Significant improvements were found in nine of twelve outcomes. These included reductions in BMI (-0.61kg/m²; [-0.93; -0.29]), body weight (-2.43kg; [-3.48; -1.38]), waist circumference (-3.46cm; [-5.21; -1.71]), body fat (-1.58%; [-2.40; -0.76]), systolic (-3.75mmHg: [-5.67; -1.82]) and diastolic (mmHg; [-3.58; -1.29]) blood pressure, LDL cholesterol (-5.9 mg/dL; [-11.6; -0.12]), and an increase in HDL cholesterol (2.76 mg/dL; [0.42; 5.09]). All significant outcomes were supported by moderate-to-high certainty evidence except LDL cholesterol, which was rated very low. Non-significant results were observed for total cholesterol, triglycerides and FBG. High heterogeneity was observed. Pre-existing health conditions, author and duration of intervention partially explained between-study heterogeneity. Conclusions: Workplace health promotion programs were associated with improvements in various cardiometabolic health indicators. Greater effectiveness was observed in interventions targeting high-risk populations, delivered by physicians or qualified health professionals, and implemented over shorter durations. Findings support the integration of such programs into occupational health policies and broader public health strategies. Future research

should optimize intervention designs, extend follow-up, and consider integrated approaches to maximize long-term benefits.

Godono et al. 2025.

Organisational Issues

Workplace safety behaviors in the context of selected employee and organizational factors: A latent profile analysis

Background: This study aimed to identify distinct employee and organizational profiles influencing workplace safety behaviors (compliance and participation) using latent profile analysis (LPA), focusing on psychological need satisfaction, work performance, and organizational safety culture. **Material and methods**: A cross-sectional survey of 1293 Polish employees across diverse sectors (industry, transportation, construction, agriculture) assessed individual factors (personal safety culture, basic psychological needs, task/contextual performance, counterproductive behaviors) and organizational factors (safety values, leadership commitment, training quality, psychosocial climate). Validated scales, including the Basic Psychological Need Satisfaction and Frustration Scale at Work, Individual Work Performance Questionnaire, individual safety culture questionnaire (Kultura bezpieczeństwa jednostki), and organizational safety culture questionnaire (Kultura bezpieczeństwa zakładu), were administered via computer-assisted web interview. Separate LPAs identified employee and organizational profiles; non-parametric tests compared safety outcomes across profiles. **Results**: Five latent profiles emerged for both employees and organizations. Employees with high basic need satisfaction, strong personal safety values, and high performance exhibited the highest safety compliance and participation. Conversely, those with unmet needs despite strong safety values showed the lowest level of safety behaviors. Organizations with holistic safety cultures (leadership commitment, tailored training, psychosocial support) achieved superior safety outcomes, while those neglecting systemic safety investments performed the poorest. **Conclusions**: Workplace safety behaviors are shaped by interactions between various individual and organizational variables. The study highlighted the importance of both organizational factors, such as safety climate, and individual factors, including need satisfaction, performance, and counterproductive behaviors. Med Pr Work Health Saf. 2025;76(6):435-447.

Kapica et al. 2025.

Job Design

Hospital unit working conditions and risk for employee injury

Background: Healthcare employees, particularly in pediatric hospitals, are at high risk of occupational injuries. However, few studies have examined hospital unit-level factors that contribute to these injuries. This study aimed to explore and quantify such risk factors in a large pediatric inpatient setting.

Methods: We conducted a secondary analysis of prospectively collected data for about 7,929 unit-days between 2014 and 2017. Data sources included an institutional injury surveillance system, incident reports collected from a sample of employees through active surveillance (voice recording), and hospital unit-based

measures of patient density and employee workload. Potential determinants of injury among hospital employees included shift length distributions, staffing metrics, patient aggression, near-miss events, and prior injuries. Mixed-effects logistic regression models with unit-level random intercepts were used to evaluate the association between unit-level risk factors and the odds that employee injuries were reported on a unit on a given day. **Results**: Shifts exceeding 13 hours on the previous day were associated with 3-4% higher odds of injury, while same-day shifts shorter than 8.5 hours were associated with a 1% reduction in injury odds. Patient aggression was identified as a significant predictor, greatly increasing the risk of injury, but the association was no longer statistically significant after adjusting for prior injuries. Prior week injuries remained a strong and consistent predictor of future injury occurrences. Near-misses detected in the past week were a significant predictor of injury reporting in unadjusted analyses, but the association was not statistically significant after adjusting for other factors. **Conclusions**: Unit-level risk factors-including work shift duration, patient aggression, and prior injury occurrences-play a significant role in employee injury risk. These findings support the importance of continuous monitoring and targeted interventions, such as shift scheduling limits and systematic near-miss reporting, to enhance occupational safety in pediatric hospital settings.

Algorithmic management is associated with psychological distress, musculoskeletal pain, and occupational accidents: A cross-sectional study in logistics

Objective: Algorithmic Management (AM) is increasingly shaping work environments across various sectors, influencing how tasks are assigned and monitored. While concerns have been raised regarding its potential impact on worker health, empirical evidence remains limited. This study examines the association between level of AM exposure and adverse health outcomes among logistics workers**. Methods**: This cross-sectional study used an online survey, targeting logistics workers in Sweden. AM exposure was measured using an 11-item scale capturing aspects such as task allocation, surveillance, and performance monitoring. Health outcomes included psychological distress, musculoskeletal pain, headaches, sleep disturbances, and occupational accidents. **Results**: Higher AM exposure was associated with increased prevalence of psychological distress (PR 2·12, 95% CI 1·49-3·02), occupational accidents (PR 1·92, 95% CI 1·22-3·01), headaches (PR 1·68, 95%CI 1·09-2·58), and musculoskeletal pain (PR 1·54, 95% CI 1·23-1·92). Stratified analyses revealed stronger associations for drivers, particularly regarding psychological distress, headaches, and sleep disturbances, while warehouse workers exhibited less consistent patterns. **Conclusions**: These findings highlight AM as a potential occupational health hazard, particularly when involving high levels of automated oversight and direction. While AM can enhance efficiency, its impact on worker well-being and public health warrants further attention and potentially mitigation strategies to inform policies that balance technological advancements with worker health protection.

Shift Work

Caffeine consumption as a potential risk factor of osteoporosis development among night shift workers: Epidemiological evidences and hypothesis

Night workers have demonstrated an increased risk of bone fracture. The mechanisms underlying the observed bone changes among night workers remain unclear. They have been attributed to hormonal changes resulting from exposure to light during nighttime, sleep restrictions and disturbances in expression of circadian rhythms genes. An additional factor that may contribute to increased bone loss among night workers is the consumption of caffeinated products. The aim of the work was to review the epidemiological evidence on the association between caffeine consumption and bone density or fracture risk and to sum up the current knowledge on the association between night shift work and osteoporosis among workers. A search of the literature was conducted in order to identify proper studies using PubMed, Scopus, Elsevier, and Springer databases. A total of 31 articles were identified. The articles were divided to 2 groups of papers assessing the bone fracture risk and osteoporosis among caffeinated beverages drinkers (24 studies) and assessing bone strength in night shifts workers (7 studies). Findings from studies assessing the relationship between caffeine consumption and bone strength appear inconsistent. However, the results of the some presented studies highlight that high caffeine intake increases bone loss. Thus, development of osteoporosis among night workers exposed to light during nighttime might be accelerated by high caffeine consumption. No epidemiological study has examined the effect of caffeine intake on the bone fracture risk among night shifts workers yet. There is a great need to better understand the etiology of osteoporosis among workers.

Bukowska-Damska et al. 2025.

A cross-sectional multifactorial analysis of chrononutrition, sleep quality and sleep patterns among healthcare shift workers

Healthcare shift workers are often linked to circadian misalignments, leading to irregular dietary behaviours, altered sleep patterns, and elevated health risks such as metabolic syndromes and psychological disorders. Despite growing recognition of these implications, limited studies have comprehensively explored how chrononutrition, sleep quality, and sleep patterns interrelate in this high-risk population. Hence, the current study aimed to examine these domains and their associations among rotating healthcare shift workers in Selangor, Malaysia. Using a cross-sectional design, all data were collected through a set of self-administered questionnaires, comprising sociodemographic data, the Malay version of the Chrononutrition Profile Questionnaire (CPQ-M), the Pittsburgh Sleep Quality Index (PSQI) and Munich Chronotype Questionnaire for Shift-Workers (MCTQShift), to assess chrononutrition behaviours, sleep quality, sleep patterns and social jetlag. The findings highlighted widespread disruptions in both chrononutrition and sleep, with 40.8 % skipping breakfast, 66.0 % reporting poor sleep quality, and 53.4 % showing signs of social jet lag. A significant association ($p < 0.05$) was observed between sleep quality and night eating behaviour, indicating that poorer sleep quality was linked to increased likelihood of night eating among shift workers. However, the majority still maintained a consistent pattern of both an eating window of 10 to 13 h between the first and last meal of the day, as well as stable night eating behaviours, with no consumption of meals or snacks within two hours before bedtime. This study is among the few to comprehensively examine chrononutrition behaviours and sleep health among healthcare shift workers. The findings underscore the need for tailored interventions, such as promoting structured meal timings, enhancing access to healthy breakfasts in workplace cafeterias, and conducting educational workshops aimed at improving nutrition and sleep hygiene among participants. These measures can help to mitigate the adverse effects of shift work and support overall health and well-being.

Sleep-related factors in shift workers: A cross-sectional cohort pilot study to inform online group therapy for insomnia

Shift workers face a heightened risk of insomnia. Recent research has yielded promising insights, but further progress is necessary to better treat insomnia in this group. The present pilot study evaluates how different characteristics impact sleep in shift workers to develop an innovative therapeutic approach. An online survey was administered to an ad hoc sample of N = 225 (112 shift workers), and correlations were calculated between sleep variables and specific characteristics (e.g., psychological impairment, personality traits, sleep-related behavior, attitudes towards sleep and shift work). Group differences between good/poor sleepers and day/shift work were determined using Mann-Whitney U-tests and Kruskal-Wallis H-tests. Regression was used to identify appropriate predictors. All factors (except perfectionism, chronotype, and importance of sleep) yielded significant results in both correlations and group differences (good/poor sleepers). The two groups of day/shift workers showed only minor differences. Dysfunctional beliefs about sleep, pre-sleep arousal, and depression were identified as predictors of poorer sleep. We conclude that interventions on psychological constraints (anxiety and depression), personality traits (anxiety, concern, emotional instability, and tension), social integration, sleep-related factors (dysfunctional beliefs, especially cognitive pre-sleep-arousal, sleep hygiene) and the attitude toward shiftwork, can replace those on regularity and will build an innovative therapy for shift workers on this basis. Once the newly developed treatment manual is finalized, its efficacy will be assessed through a randomized controlled trial.

Association between work shifts, occupational stress, and abdominal obesity in female workers in Southern Brazil

Background: Night work and occupational stress contribute to weight gain and abdominal fat accumulation through behavioral and metabolic changes. This study investigated the relationship between occupational stress, work shifts, and abdominal obesity among female workers in Southern Brazil. **Methods**: This repeated cross-sectional study included two samples collected in 2017 and 2022, each comprising 400 female workers from two factories located in Southern Brazil. Abdominal obesity was measured by waist circumference (WC ≥ 88 cm), and occupational stress was assessed using the Job Stress Scale - short version. Data on demographic, socioeconomic, occupational, reproductive, and health variables were collected. Poisson regression with robust variance was used for multivariate analysis, stratified by occupational stress (absence vs. presence) and adjusted for potential confounders. **Results**: The workers' mean ages were 35.8 ± 9.0 years (2017) and 34.2 ± 9.9 years (2022). The prevalence of abdominal obesity was 45.1% (95% confidence interval [CI]; 40.2-50.0) in 2017 and 43.0% (95% CI, 38.1-47.9) in 2022, while occupational stress was observed in 22.9% (95% CI, 18.8-27.1) and 21.0% (95% CI, 17.0-25.0) of the workers, respectively. Among workers with occupational stress, nightshift workers were twice more likely to have abdominal obesity compared to daytime workers (2017; prevalence ratio [PR] = 2.23, 95% CI; 1.47-3.38, p < 0.001; 2022; PR = 1.80, 95% CI; 1.06-3.06, p = 0.029). No significant association was observed between work shifts and abdominal obesity among workers without occupational stress. **Conclusion**:

Occupational stress significantly modified the relationship between nighttime work and abdominal obesity. This study found a high prevalence of abdominal obesity, especially among female night shift workers, with no significant changes in prevalence rates between 2017 and 2022.

Lymphocytes and related inflammatory factors as predictors of metabolic syndrome risk in shift workers: A machine learning approach based on large-scale population data

Background: Metabolic syndrome (MetS) is characterized by chronic inflammation and can be worsened by circadian disruption, which is common among shift work. Machine learning can predict the risk of MetS in shift workers using inflammatory biomarkers. Most investigations have focused on the general population rather than shift workers, a distinct group that requires continuous health monitoring; therefore, we aimed to examine the relationship between inflammatory indicators and MetS using blood cell counts in this high-risk group of shift workers who require long-term health monitoring and to enhance the biological understanding of MetS by applying machine learning methods. **Methods**: In this cross-sectional study, we analyzed data from shift workers included in the National Health and Nutrition Examination Survey between 2005-2010 and 2017-2018. Prediction models, including random forest (RF), extreme gradient boosting (XGBoost), light gradient boosting machine (LightGBM), and linear regression (LR), were developed and validated. We compared the model performance and conducted stratified analysis, smooth curve fitting, and threshold effect analysis to further explore the relationship between inflammation and MetS risk in shift workers. **Results**: The analysis included 3,079 participants in total. Each machine learning model demonstrated good predictive performance in assessing MetS risk among shift workers. LightGBM achieved the area under the curve (AUC) of 0.944 in training dataset and 0.722 in testing dataset; XGBoost had an AUC of 0.818 in training dataset and 0.747 in testing dataset; and LR had an AUC of 0.763 in training dataset and 0.699 in testing dataset, RF had an AUC of 0.741 in training dataset and 0.729 in testing dataset. Furthermore, the analysis revealed that body mass index, age, neutrophil, lymphocyte, monocyte, and platelet counts, along with their derived inflammatory indices, were significant predictors. Multivariate logistic regression adjusted for lifestyle and health factors showed that lymphocytes remained consistently associated with MetS in shift workers. Generalized additive model analysis revealed complex non-linear relationships between lymphocytes and platelets. Inflammatory factors strongly predicted MetS risk in shift workers, with their effects varying by concentration threshold, particularly for lymphocytes (k = 2.2, right side p < 0.001). **Conclusion**: Lymphocyte counts and related composite indices are significant predictors of MetS risk in shift workers. Consistent monitoring of these biomarkers may be useful for early odds-based stratification of MetS in this high-risk population, whereas any preventive implications would require confirmation in longitudinal and interventional studies.

Cognitive factors increase the risk of shift work disorder through insomnia symptoms

Objectives: The primary aims of the current study were to 1) investigate whether cognitive factors are associated with an increased risk of shift work disorder (SWD), and 2) whether symptoms of insomnia and/or excessive sleepiness mediate this association. Additionally, a third exploratory aim of the study was to examine whether these mediators of insomnia and excessive sleepiness vary in the relationship between cognitive factors and two phenotypes of SWD (i.e., SWD with high insomnia and low excessive sleepiness (SWD-I), and SWD with high excessive sleepiness with or without high insomnia (SWD-E)). **Methods**: Shift

workers (n = 126), predominantly working a schedule involving night shifts, completed a survey comprising measures of SWD risk, insomnia, excessive sleepiness, and cognitive factors, including pre-sleep cognitive and somatic arousal, dysfunctional beliefs about sleep, and sleep reactivity. **Results**: Logistic regressions found cognitive factors were not associated with SWD risk. Mediation analysis showed insomnia symptoms mediated the impact of pre-sleep somatic arousal, dysfunctional beliefs about sleep, and sleep reactivity on high SWD risk. Of those at high risk of SWD (37 %), 43 % and 34 % had the SWD-I and SWD-E phenotype, respectively. Insomnia symptoms mediated the relationship between all cognitive factors and SWD-I, but not SWD-E. **Conclusions**: Although cognitive factors were not directly associated with SWD risk, insomnia severity, but not excessive sleepiness, was a significant cross-sectional mediator in the relationship between cognitive factors and risk of SWD. When exploring SWD phenotypes, cognitive factors were associated with a risk of having SWD when participants did not have excessive sleepiness (i.e., SWD-I). To expand on our findings, future research should investigate insomnia's role as a mediator in individuals diagnosed with SWD and to investigate the SWD phenotypes with larger samples.

Association between shift work and levels of thyroid hormones and interleukin-37

Objective: Symptoms of thyroid defects involve sleep disorders, gain or loss of weight, tremors of hand, constipation, dry skin, bradycardia, diarrhea, irregular menses, and hot or cold tolerance. Workers in different professions face different situations that can lead to stress. This study aimed to examine the association between shift work (office or irregular) and thyroid function indicators, interleukin-37 (IL-37) levels, and development of chronic diseases (cardiovascular, diabetes). **Methods**: The current study comprised three groups: 1) office staff, 2) irregular staff (comprising different jobs), and 3) controls (not working subjects). Eighty-five subjects, aged 30-55 years, were included in the study. Body mass index (BMI) was calculated for each participant. Venous blood was collected and serum levels of triiodothyronine (T3), thyroxine (T4), thyroid-stimulating hormone (TSH), and thyroid peroxidase (TPO) were determined by electrochemiluminescence (ECL) analysis using an automatic immunochemical analyzer Cobas E 411 (Roche Diagnostics, Germany). Serum IL-37 levels were measured using ELISA kit. **Results**: Serum T3 ($p<0.01$) and T4 ($p<0.001$) levels were significantly decreased in both office and irregular shift work groups compared to the controls. The mean T3 levels were higher in subjects with irregular shift work (1.162±0.11 ng/mL) compared to subjects with office shift work (1.14±0.12 ng/mL). Significantly increased TSH and TPO serum levels ($p<0.01$) were found in both the irregular shift work and office shift work groups compared to the control group. Similarly, IL37 levels were significantly increased in office shift work (294.8±21.05 ng/mL) and irregular shift work subjects (278.0±16.22 ng/mL) ($p<0.001$) compared to controls (56.5±0.28 ng/mL). Cardiac disease ($p<0.01$), hypertension ($p<0.001$), and diabetes ($p<0.001$) showed significant differences between subjects with office shift work, irregular shift work, and the control group. **Conclusion**: Elevated levels of IL-37 and TSH in shift workers may serve as biomarkers of the impact of shift work and the workplace on the immunological and hormonal status of employees.

Management and Leadership

Do stronger employer responsibilities enhance work accommodation for sick-listed workers? Evidence from a Dutch reform

This paper studies the impact of stronger employer responsibilities for facilitating work resumption of sick or disabled workers on employers' workplace accommodation efforts during sick leave. We exploit a reform in the Netherlands that altered experience rating-that is, shifting the costs of sick leave and disability insurance to the firm-both for permanent and non-permanent employees. Using unique Dutch survey data on workplace accommodation of long-term sick-listed workers, we show that experience rating has no significant impact on accommodation efforts. Moreover, we provide evidence that the reform led to more firms opting for self-arranging both the sick leave benefits and the reintegration process of sick non-permanent workers, instead of using the public insurance scheme.

The effect of inclusive leadership on employee wellbeing

Employee well-being has increasingly emerged as a central concern for both organizations and society. However, our understanding of how and when inclusive leadership enhances employee well-being remains limited. Based on self-determination theory and the socially embedded model of thriving at work, this study explored the relationship between inclusive leadership, growth need strength, employee thriving at work, and well-being. Data were collected from 62 teams that totaled 337 full-time employees through a three-wave time-lagged questionnaire. Path analysis and Monte Carlo simulations were conducted on data for hypothesis testing. The results showed that inclusive leadership is positively related to employee well-being. Employee thriving at work played a mediating role between inclusive leadership and employee well-being. Growth need strength moderated the relationship between inclusive leadership and employee thriving at work. These findings are expected to provide valuable insights for organizations aiming to enhance employee thriving at work and well-being.

Work Ability

Exploring sense of coherence (SOC) in relation to working conditions for employees with hearing loss

Background: People with hearing loss (HL) report several challenging situations in working life (WL). HL can negatively affect, e.g., the ability to communicate, creating barriers and difficulties in WL. However, there is a lack of studies that investigates salutary aspects in relation to working conditions for the target group. Sense of Coherence (SOC) is a salutary concept widely used when investigating aspects in WL but is less explored in relation to HL. : To explore the concept of Sense of Coherence (SOC) in relation to working conditions for employees with HL. **Methods**: An observational study with a cross-sectional design including people with HL in working age using hearing aids (HAs) or cochlear implants (CIs). Comparisons were made between participants "in work" and participants on "HL-related sick leave". **Results**: The "in work" group reported a higher SOC compared to the "HL-related sick leave" group. The analysis showed significant differences between the two groups in all three dimensions of SOC with the "in work" group being better

off in almost all investigated variables. **Conclusion**: SOC is a valuable concept for investigating working conditions for employees with HL. The results indicate that to increase the possibility of salutary working conditions, it is necessary to focus on consequences of HL, such as the need for recovery, autonomy and support. Addressing these aspects increases employees' comprehension of and ability to manage the work situation and their sense of meaningfulness, which may act as a buffer against work-related stress and reduce the risk of sick leave.

Effect on work ability and health-related quality of life following an interactive patient education aiming to increase sense of coherence and health literacy: The LEARN-to-COPE cluster randomized trial

Objective: To evaluate the effect of the LEARN-to-COPE intervention on sick leave, symptoms, and coping. **Design and setting:** Cluster-randomized controlled trial including 40 primary care centers (PCCs) in Region Västra Götaland, Sweden. Randomization at the PCC level. Effect of the intervention was compared to Care-as-Usual (CAU). Follow-up was conducted using registry sick leave data, validated questionnaires, and patient-reported data. **Subjects:** Primary healthcare patients with recurrent or long-term sick leave or health-related unemployment from included PCCs (n = 243). **Intervention:** Patient education was conducted via interactive study groups, which convened for half a day every week over eight consecutive weeks. Implementation was centralized in close collaboration with educational associations. The purpose of the intervention was to strengthen participants' sense of coherence and health literacy, with the aim of enhancing their work ability and health. **Main outcome measures:** The primary outcome measure was change in scheduled activity, derived from data on sick leave (obtained from the Swedish Social Insurance Agency) and participation in work-oriented rehabilitation (self-reported occupational status). Secondary outcomes (symptoms and coping) were measured with validated questionnaires at baseline and follow-ups after 3, 6, and 12 months. **Results**: Included participants suffered from anxiety, depression, exhaustion, and pain and had poor health-related quality of life. After 12 months, there was no significant change in scheduled activity, sense of coherence, symptoms, or health-related quality of life, but a statistically significant positive change in health literacy and self-efficacy was found in the intervention group. **Conclusion**: Considering participants' pronounced burden of symptoms, the focus should be on improving the sick leave process as a whole, rather than seeking quick remedies for patients' complex health issues. Centralized implementation of the intervention was a promising concept that deserves further evaluation. **Trial registration number**: Clinicaltrials.gov NCT04254367.

Adapting to the Future of Work

Aging Workforce

Strategies to improve recruitment, retention, working conditions, and skills among the long-term care workforce: An umbrella review of existing evidence

Background: Population ageing has an impact on the need for long-term care (LTC) because functional limitations increase with age. Most older adults require support from family or formal LTC providers; thus, there is an urgent need for strategies to strengthen LTC workforce recruitment and retention. **Objective**: To conduct an umbrella review to assess the strategies used to improve recruitment, retention, working conditions, and skills development of the formal LTC workforce. **Methods**: Following the PRIOR guidelines and after protocol registration on PROSPERO, we conducted an umbrella review and searched four databases: MEDLINE, Embase, CINAHL, and Web of Science for intervention studies between 1946 and June 2024. Eligible studies were systematic reviews of interventions targeting formal LTC workers caring for adults aged 60 years and older. Two reviewers screened, extracted data, and appraised methodological quality. **Results**: Of 10,475 screened articles, 19 reviews met the inclusion criteria. Continuing professional development and peer-led training consistently improved staff knowledge and competencies, and sometimes job satisfaction and turnover. The evidence for well-being programs and policies was limited and heterogeneous; overall, most reviews were of low quality. **Conclusions**: Future research should improve the context and workforce roles, adopt standardized outcomes, and rigorously evaluate organizational and policy interventions.

Mapping the factors of loneliness in older adults: The role of employment and work activity: A scoping review

Loneliness and social isolation are increasingly recognized as major public health challenges, particularly among older adults. This review aims to identify and map the key risk and protective factors associated with loneliness and social isolation, with particular emphasis on the role of employment and work activity in later life. In accordance with Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) guidelines, peer-reviewed studies published in 2019-2025 in the PubMed and Scopus databases were analyzed. The results showed that health-related, psychological, sociocultural, and socio-environmental factors are closely associated with the experience of loneliness in old age. The most numerous were health-related and sociocultural factors. Employment and social engagement played a particularly important role in mitigating loneliness by providing structure, purpose, and social contact. The transition from work to retirement was identified as a critical life stage that can either intensify or alleviate loneliness, depending on individual circumstances and the cultural context. Future research should adopt a longitudinal and cross-cultural approach to better understand how the moment of retirement affects loneliness in the long term. There is also a need to explore gender and socioeconomic differences in how older adults experience and cope with social isolation. Moreover, evaluating the effectiveness of workplace and community-based interventions aimed at fostering social connectedness after retirement could provide valuable evidence for developing public health strategies that support healthy and active ageing. Int J Occup Med Environ Health. 2025;38(6):572-85.

Late-career workforce participation in times of rising state pension age: The role of health and motivation

Background: This study addresses late-career workforce participation and its association with health and motivation during nine years in which state pension age (SPA) rose gradually from 65 to 66.6 years in the Netherlands. **Methods**: Using the Longitudinal Aging Study Amsterdam, we studied workers aged 61-63 years who at 3-year follow-up had reached ages 64 years up to SPA, in 2013-2016 (n = 82), 2016-2019 (n = 111), and 2019-2022 (n = 119). Workforce participation was defined as continued working and number of working hours/week. Physical and mental health included self-rated health, functional limitations, depressive symptoms, and cognitive ability. Motivation consisted of self-reported reasons for (change in) workforce participation. Logistic (continued working) and linear (working hours) regression models were controlled for age, sex, educational level, and partner status. **Results**: Over time, 58% (2013-2016), 82% (2016-2019), and 72% (2019-2022) continued working. Among the health indicators, only better self-rated health predicted continued working, and only in 2019-2022. In continuing workers, working hours remained stable around 31 h in 2013-2016 and 2016-2019, but decreased to 26 h in 2019-2022. Poorer physical health predicted a decrease in working hours only in 2013-2016. Only in 2019-2022, better mental health was significantly associated with a reduction in working hours. Exited workers and workers who had reduced their working hours reported a lack of motivation to work more often in 2022 than in 2019.
Conclusions: In a period of rising SPA, an increasing share of workers aged 61-SPA continued work participation. Health played a minor role, whereas motivation to work became more important. Our findings suggest that the feasibility of maintaining late-career workers in the workforce requires attention to both health maintenance and enhancement of motivational factors at work.

Technology

Machine-learning-based fatigue trend analysis on IMU Wearable Sensor Data from construction site workers

Physical fatigue is a major cause of work-related accidents and musculoskeletal injuries in the construction industry, and additional means are needed for their identification and management to prevent long-term consequences. Based on recent scientific literature, fatigue can be detected with wearable inertial measurement units (IMUs). However, IMUs for detecting fatigue have been so far tested mainly in the laboratory; therefore, a research gap exists in application of IMU sensors for detecting fatigue in real-life work settings. The aim of this paper is to bring the fatigue trend detection with IMUs closer to real-life context by using wearable IMU sensor data from an actual construction site measuring actual workers with simulated work tasks. The paper also presents advancements in fatigue trend detection with frequency domain investigations to gain access to more detailed fatigue relevant features. Machine-learning methods are used to predict fatigue trends based on IMU data, resulting in fatigue trend detection accuracy that advances the state of the art. More knowledge is also unearthed about relevant sensor locations and features.

Work Environment

Remote work opportunities and preferences among public health employees: Implications for job satisfaction, burnout, and retention

Objective: The purpose of this study is to describe individual and organizational characteristics among those who report working remotely and examine how concordance between public health employees' work preferences and their actual work situations relates to burnout, satisfaction, and intention to leave. **Design**: This cross-sectional study utilizes the 2024 Public Health Workforce Interests and Needs Survey (PH WINS). Bivariate relationships were analyzed by conducting chi-squared tests of individual and organizational characteristics by respondents' reported work situation, work preference, and concordance between work situation and work preference. Multivariate logistic regression models of workforce outcomes were performed holding race/ethnicity, gender, age, education level, public health degree attainment, role classification, tenure at current agency, current employer, current employment status, full-time employee, supervisory status, setting, and governance constant. **Setting**: A nationally representative sample of government public health employees. **Participants**: 55 742 government public health employees. **Main outcome measures:** Job satisfaction, burnout, and intention to leave. **Results**: Among respondents, most worked in-person, and 52.2% reported that their work situation matched their preference. Job satisfaction was high for the majority of respondents. Nearly 20% reported burnout, and 24.8% reported that they intended to leave their organization within a year. Work situation and preference varied significantly by age, education, tenure, employment status, and organizational setting. Older and less educated staff were more likely to work in their preferred setting (in-person). Multivariate models showed that concordance between work situation and preference was significantly associated with higher satisfaction and lower burnout and intent to leave. **Conclusions**: Findings show that employees whose work situations align with their work preferences report higher job satisfaction, lower burnout, and decreased intention to leave their organizations. These effects are most pronounced among younger and highly educated workers, who experience more difficulty in achieving this alignment.

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Keywords: Burnout; intention to leave; job satisfaction; public health workforce; remote work.

Evidence Level: 4B

Link:
https://journals.lww.com/jphmp/fulltext/2026/01001/remote_work_opportunities_and_preferences_among.17.aspx