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Workplace Research Monthly

August 2025

This Workplace Research Monthly includes the latest peer-reviewed articles, reports and evidence on a range of workplace health and safety, prevention, recovery at work and return to work topics that were published in July 2025 only.

Comcare does not conduct critical evaluations of the articles listed in the Workplace Research Monthly. Articles are arranged from highest to lowest quality based on levels of evidence outlined in table 1 and 2.

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Description of Evidence Levels Definitions Used in this Review

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 we provided 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
B	Study conducted outside Australia and confounders likely to affect generalisability

Enabling Healthy and Safe Workplaces

Health and Wellbeing

Systematic review of the literature on indoor air quality in healthcare units and its effects on health

Background: Indoor air quality in healthcare facilities such as hospitals and health centres is increasingly considered an important factor for the health and well-being of their occupants, namely workers and patients/users. **Methods:** The principal objective of this study was to identify the recent research interests on the subject by carrying out a systematic literature review using the PRISMA methodology applied to systematic reviews and meta-analyses. Of the articles published between 1st January 2019 and 31st March 2024, 38 were selected and analysed. **Results:** The results indicated that there has been considerable worldwide interest in the subject of Indoor Air Quality in healthcare units, particularly hospitals, and that it is spread across a wide variety of scientific journals. Hospitals were the healthcare unit with the greatest interest in the evaluated studies and the most studied locations were wards, intensive care units, operating theatres, and emergency rooms. A textometric analysis of the selected articles using IRaMuTeQ software identified five main topics studied: (i) physicochemical parameters; (ii) temperature and humidity assessment; (iii) measures to be adopted to improve the quality of environmental factors and symptoms and/or diseases associated with poor indoor air quality; (iv) infrastructure design and management; and (v) assessment of microbiological parameters. Most of the analysed articles reported data assessed by experimental methods, with the most frequently assessed parameters being carbon dioxide and particulate matter, temperature and relative humidity and chemical parameters (total volatile organic compounds, carbon monoxide, formaldehyde, and nitrogen dioxide). **Conclusions:** The study provides an overview of recent literature on this subject, presenting guidelines for preserving and improving indoor air quality in healthcare units.

Loureiro et al. 2025.

BMC Public Health, vol. 25, no. 1.

Keywords: Healthcare units; hospitals; indoor air quality; occupational health; public health.

Evidence Level: 1A

Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23445-1

Scoping total worker health: An expanded view of worker well-being

Objective: The study conducts a scoping review of Total Worker Health (TWH) literature to identify disciplines and issues addressed in this field. **Methods:** We identified 384 citations published from January 2010 to June 2023. **Results:** Citations were organized by discipline. Nine disciplines and 26 subdisciplines contribute to the knowledge base of TWH. Comparing the bodies of literature with the TWH priority issues showed variation in coverage across disciplines with some overlap in issues covered with occupational health (OH), the discipline with the largest literature, but several disciplines cover issues OH does not. **Conclusions:** Our findings indicate that many disciplines with potential contributions to TWH have not been incorporated into the mainline TWH literature. The TWH field of research and practice could be advanced by greater collaboration among disciplines to integrate findings with all disciplines addressing worker well-being.

Banks et al. 2025.

Journal of Occupational and Environmental Medicine, vol. 67, no. 7.

Keywords: Total Worker Health; healthy work; occupational health; scoping review; workplace health and well-being.

Evidence Level: 1A

Link:
https://journals.lww.com/joem/fulltext/2025/07000/scoping_total_worker_health__an_expanded_view_of.12.aspx

Eating disorders in the workplace

Background/Objectives: Although eating disorders (EDs) affect a large portion of the population and have a significant impact on health and productivity, they are understudied in the workplace. We assessed the frequency of EDs and studied the relationship between EDs and occupational and individual factors. **Methods**: All workers undergoing health surveillance were invited to fill in the Eating Disorder Examination Questionnaire, short form (EDE-QS) and, before their routine medical examination that included metabolic tests, measure their level of health literacy, stress, quality of sleep, anxiety, depression, and happiness. Out of a total of 2085 workers, 1912 (91.7%) participated. **Results**: Suspected EDs affected 4.9% (CI95% 3.9; 5.9) of workers, with no notable difference in gender (5.3% CI95% 4.1; 6.7 in female workers vs. 4.2%, CI95% 2.9; 5.9 in male). Cases were significantly associated with trauma and emotional factors (anxiety, depression, unhappiness), but also with work-related stress and poor sleep quality, and negatively associated with health literacy. Using a hierarchical logistic regression model, suspected cases of EDs were significantly predicted in Model II by life trauma (OR 2.21 CI95% 1.40; 3.48, $p < 0.001$) and health literacy (OR 0.94 CI95% 0.90; 0.98, $p < 0.001$), in Model III also by work-related stress (OR 2.57 CI95% 1.68; 3.94, $p < 0.001$), and in Model IV by depression (OR 1.19 CI95% 1.02; 1.38, $p < 0.05$) and happiness (OR 0.88 CI95% 0.78; 0.99, $p < 0.05$). An association was also found between EDs and overweight, obesity, increased abdominal circumference, hypercholesterolemia, hypertriglyceridemia, hyperglycaemia, arterial hypertension, atherogenic index of plasma, and metabolic syndrome. **Conclusions**: The workplace is an ideal setting for the prevention of EDs and their consequences. Occupational health intervention should promote health literacy, improve sleep quality, and reduce work-related stress.

Magnavita et al. 2025.
Nutrients, vol. 17, no. 4.

Keywords: Anxiety; cardiovascular risk; depression; happiness; health literacy; health promotion; metabolic syndrome; obesity; sleep; stress.
Evidence Level: 4B
Link: https://www.mdpi.com/2072-6643/17/14/2300

Relationships between job characteristics and occupational well-being: Are they similar across levels of analysis?

Theory and practice in occupational health psychology have hitherto mostly assumed that how job characteristics relate to occupational well-being is similar across levels of analysis, yet this remains empirically underexplored. We tested this implicit "assumption of homology" using the Demand-Control Model as our starting point. We analysed three-level data from 12,658 employees in 1,116 work units from 243 organizations in the Netherlands. Results indicate that for job demands and participation homology of relationships is mostly confirmed, but not for skill variety and job autonomy. In addition, we generally did not find relationships becoming stronger from the individual to the departmental to the organizational level. Future theory needs to conceptualize better how individual and aggregate-level effects of skill variety/autonomy combine and interact in influencing occupational well-being. For these job characteristics we need multi-level theorizing. For practice, our results point towards caution in using individual survey scores on skill variety/autonomy for the purpose of risk monitoring and proposing follow-up policy/interventions at aggregate levels such as departments and organizations.

van Veldhoven et al. 2025.
PLoS One, vol. 20, no. 7.

Keywords: Occupational wellbeing; job characteristics; relationships; analysis.
Evidence Level: 4B
Link: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0328508

Association of workplace toilet access with urinary tract symptoms and productivity loss among female workers

This study investigated workplace toilet access related to lower urinary tract symptoms (LUTS) among women in the Korean workforce. A cross-sectional survey was conducted to determine demographic characteristics, occupational risk factors, and urinary tract symptoms among employed Korean women. Occupational risk factors included two survey questions about access to toilets at work. LUTS were assessed using the overactive bladder symptom score (OABSS) and international consultation on incontinence questionnaire-urinary incontinence short form (ICIQ-SF). Health-related productivity losses (HRPL) were estimated using the work productivity and activity impairment questionnaire for urinary symptoms (WPAI-US). Multiple logistic regression was used to determine the association between workplace toilet access and LUTS. In addition, generalised linear regression analysis was performed to assess HRPL according to workplace toilet access. Of the 1057 participants, 260 (24.6%) and 294 (27.81%) had overactive bladder and urinary incontinence, respectively. More than 50% reported poor access to toilet. Multiple logistic regression analysis showed that the lower the access to toilets in the workplace, the higher the incidence of LUTS and the higher HRPL. In conclusion, restricted access to toilets at work are associated with poor urinary health and loss of productivity.

Lee et al. 2025.

Industrial Health, vol. 63, no. 4.

Keywords: Overactive; productivity; toilet facilities; urinary bladder; urinary incontinence; workplace.

Evidence Level: 4B

Link: https://www.jstage.jst.go.jp/article/indhealth/63/4/63_2024-0160/_article

Metabolic syndrome and cardiovascular risk factors among bank employees in Iran: A cross-sectional study

Background: Metabolic syndrome (MetS) and cardiovascular disease (CVD) are growing occupational health concerns, particularly among sedentary and high-stress professions. This study investigates the prevalence of MetS and related cardiovascular risk factors among Iranian bank employees. **Methods:** This cross-sectional study included 1,661 bank employees in Tehran, enrolled between January and March 2023. Participants completed physician interviews, provided fasting blood samples, and underwent clinical assessments. Demographic and occupational data, smoking status, blood pressure, and biochemical markers were collected. MetS was defined using ATP III criteria, and 10-year ASCVD risk was calculated using the 2019 ACC/AHA Pooled Cohort Equations. Data analysis was performed with SPSS 27.

Results: Among participants, the mean age was 43.4 (5.9) years, and a body mass index of 27.3 (4) kg/m² (73.5% men; 91.8% non-smokers) were included. The prevalence of MetS was 26.2% (95% confidence interval [95%CI]: 24.1-28.3), with low HDL cholesterol as the most frequent component. Compared to operational staff, management employees had significantly higher odds of key MetS components, including high blood pressure (52.7% vs. 44.1%; OR: 1.41, 95% CI: 1.16-1.71; P = 0.001), elevated triglycerides (33.4% vs. 26.2%; odds ratio [OR]: 1.41, 95% CI: 1.14-1.75; P = 0.002), elevated FBS (10.9% vs. 5.5%; OR: 2.09, 95% CI: 1.45-3.01; P < 0.001), low HDL (82.3% vs. 70.4%; OR: 1.96, 95% CI: 1.54-2.49; P < 0.001), and abdominal obesity (26.9% vs. 18.5%; OR: 1.62, 95% CI: 1.28-2.05; P < 0.001). Older age (adjusted OR: 1.03, 95% CI: 1.01-1.05; P < 0.001) and managerial roles (adjusted OR: 0.71, 95% CI: 0.56-0.91; P < 0.001) were significant determinants of MetS. The median ASCVD risk score was higher in men than women (2.2 [IQR: 1.4-3.7] vs. 0.6 [0.4-0.9]; P < 0.001) and in management staff compared to operational staff (2.2 [1.3-3.7] vs. 0.3 [0.7-2.4]; P < 0.001). Age (adjusted OR: 1.17, 95% CI: 1.14-1.20; P < 0.001) and management position (adjusted OR: 2.24, 95% CI: 1.70-2.95; P < 0.001) were independently associated with increased ASCVD risk.

Conclusion: MetS is prevalent among Iranian bank employees, with older age, male sex, and managerial positions identified as significant associated factors. These findings underscore the need for targeted workplace health interventions and further research to evaluate cardiometabolic risk across occupational settings.

Izadi et al. 2025.

BMC Public Health, vol. 25, no. 1.

Keywords: Bank workers; cardiovascular disease; metabolic syndrome; occupational medicine.
Evidence Level: 4B
Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23758-1

Uncovering gaps in workforce well-being: a national look at survey practice in Dutch university medical centres: An exploratory quantitative study

Introduction: Maintaining a healthy workforce is crucial for safe, high-quality care. To enhance well-being and engagement in Dutch university medical centres (UMCs), an overview of staff well-being and job perceptions is needed first. Surveys are widely used to improve working conditions, but varying questionnaires hinder a comprehensive view. This study aimed to evaluate the content of employee surveys currently used in UMCs in the Netherlands from a well-being perspective and to analyse the survey results at a national level. **Methods:** All seven UMCs were approached to participate in the study and share employee survey data. The primary outcome of interest is work experience; a secondary analysis was conducted. Items were categorised following the Job Demands-Resources model. Descriptive statistics were presented as percentages, means and medians with IQRs. **Results:** Two UMCs participated and 31 862 completed surveys were included. Variation in survey items (eg, 15-18 subcategories, 21-33 question items), response options (eg, 1-5, 1-10), frequency (1-3 times per year) and timing were found. Scores on the following outcomes are presented: work overload, coworker support, job control, organisational justice, participation in decision-making, performance feedback, possibilities for learning and development, recognition, task variety, team atmosphere, team effectiveness, trust in leadership, other job resources, connecting/inspiring leadership, self-efficacy, goal-directiveness, boredom, burnout, job satisfaction, work engagement, other employee well-being, commitment organisation/team and work ability. Results should be interpreted with caution, and solely found for hospital A, for certain job control items, median scores of 2 or 3 were observed, whereas the majority of other question items revealed a median score of 4. **Conclusions:** There is a significant lack of cohesion across employee surveys. As it stands, employee surveys in Dutch UMCs are not effective tools for monitoring the work experience or well-being of the healthcare workforce. While these surveys may support management decisions, this support is not reflected in interventions related to work and the work environment.
Boskma et al. 2025.
BMJ Open, vol. 15, no. 7.

Keywords: Burnout, professional; caregiver burden; caregivers; health policy; occupational health services.
Evidence Level: 5B
Link: https://bmjopen.bmj.com/content/15/7/e094939.long

Out of office: A diary study on remote work's impact on well-being through psychological basic needs

This study explored the impact of remote work on well-being through self-determination theory, which highlights the importance of fulfilling psychological needs for autonomy, competence, and relatedness. Data were gathered from 85 employees in city administration through 605 daily assessments over a two-week period. The results indicated that remote work positively affected well-being by fulfilling employees' needs for autonomy and competence. While it led to a decrease in feelings of relatedness, this decline did not negatively influence overall well-being. Furthermore, the increase in well-being driven by greater autonomy and competence was associated with enhanced helping behaviour toward colleagues. Given that these results were significant at the within- (but not between-) person level, the findings suggest that a hybrid model combining remote and office work may be the most effective strategy for enhancing employee well-being - and, in turn, promoting pro-social behaviour in the workplace.
Kesenheimer et al. 2025.
Acta Psychologica, vol. 257.

Keywords: Diary study; helping behavior; remote work; self-determination theory; well-being.

Evidence Level: 5B
Link: https://www.sciencedirect.com/science/article/pii/S0001691825003981?via%3Dihub

Work Health and Safety

Physical work in humid heat impairs postural balance during simulated construction tasks at height

Purpose: Occupational heat strain can impair construction workers' motor and cognitive functions, potentially leading to accidents, injuries and lowered productivity. We examined the effects of physical work under various warm and humid tropical conditions on performance in virtual reality (VR)-based construction tasks. **Methods:** Eighteen healthy men (age: 29 ± 5 yr) completed three randomized, counterbalanced experimental trials comprising ~2.5 h of exposure to wet-bulb globe temperatures of 24.6°C ± 0.2°C (COOL), 28.1°C ± 0.3°C (WARM), and 32.4°C ± 0.3°C (HOT), representing Singapore's current (COOL and WARM) and projected (HOT) conditions. Participants performed three 30-min bouts of treadmill walking at fixed metabolic heat productions representing light (EX1: 250 W), moderate (EX2: 350 W), and heavy (EX3: 450 W) workloads, each separated by completion of a battery of VR-based construction tasks (welding and plank-walking at height). Task speed and accuracy, postural sway, and gait were recorded during the VR tasks, whereas body core (Tc) and mean skin temperatures (Tsk), and heart rate were recorded continuously. **Results:** Posttrial T c was higher in HOT (38.6°C ± 0.4°C) compared with WARM (38.1°C ± 0.3°C; $P < 0.001$) and COOL (37.9°C ± 0.3°C; $P < 0.001$), whereas mean Tsk ($P < 0.001$) and heart rate ($P < 0.001$) differed between all conditions (HOT > WARM > COOL). Task speed and accuracy during welding and plank-walking were similar between conditions (all $P > 0.05$). However, postural sway velocity during welding increased (by 2.08 ± 2.5 mm·s -1 ; $P < 0.05$) from baseline to posttrial in HOT but not in WARM or COOL (both $P > 0.05$). **Conclusions:** Although task performance was maintained across environments, postural balance during an attention-demanding task (welding) was impaired following physical work in Singapore's projected environmental conditions, which could increase the risk of potentially fatal accidents and injuries (e.g., falling from height). Effective workplace interventions are needed to protect workers' health, safety, and productivity against future warming.
Tan et al. 2025.
Medicine and Science in Sport and Exercise, vol. 57, no. 7.

Keywords: Cognitive performance; humid heat; injury prevention; motor function.
Evidence Level: 2B
Link: https://journals.lww.com/acsm-msse/fulltext/2025/07000/physical_work_in_humid_heat_impairs_postural.30.aspx

Buffalo Cardio-Metabolic Occupational Police Stress (BCOPS) study: A seven- and twelve-year prospective analysis of occupational exposures and health outcomes among police officers

Objective: Overall, police officers have higher rates of several adverse health conditions (e.g., cardiovascular health profiles and post-traumatic stress disorder (PTSD)) compared to persons in many other occupations. Our objective was to conduct a comparative study of occupational exposures and health outcomes among police officers across: (a) a 7-year period, from the baseline examination (2004-2009) to the 1st follow-up examination (2011-2015) and (b) a 12-year period, from baseline to the 2nd follow-up examination (2015-2019). **Methods:** Participants were from the Buffalo Cardio-Metabolic Occupational Police Stress (BCOPS) Study. Variables were assessed through self-report, standardized validated questionnaires, or standardized medical procedures. We computed the 7- and 12-year changes in mean values (for continuous/numeric variables) or prevalence (for categorical variables) and the corresponding 95% confidence intervals (CIs) using MIXED and GENMOD procedures in SAS. **Results:** Occupational stress significantly increased over 12 years [3.4; (95% CI 1.2, 5.6)]. The percentage of officers who reported excellent/very good health significantly decreased across both time periods: [- 11.8%; (- 17.8, - 5.9)] across seven years and [- 17.3%; (- 24.2, - 10.4)] across 12 years. The prevalence of metabolic syndrome increased

over seven years [10.7%; (5.3-16.0)] and over 12 years [7.4%; (0.1-14.0)]. Abdominal obesity and glucose intolerance significantly increased over both time periods while hypertension and elevated triglyceride levels increased slightly but not significantly over both time periods. **Conclusion:** Occupational stressors and some health outcomes of officers worsened over time indicating the need for self-health monitoring and wellness programs for police.
Violanti et al. 2025.
International Archives of Occupational and Environmental Health , vol. 98, no. 4-5.

Keywords: Cardiovascular disease; depression; health; PTSD; police officers; stress.
Evidence Level: 4B
Link: https://link.springer.com/article/10.1007/s00420-025-02142-x

Sun protection knowledge and behaviours among agricultural industry Workers in Pennsylvania

Objectives: Outdoor occupations like agriculture expose individuals to higher levels of ultraviolet radiation, increasing the risk of skin cancer. Although most individuals in agriculture recognize the importance of sun protection, adherence to preventive measures may be inconsistent. Our study aimed to explore sun protection behaviours among agricultural industry workers in Pennsylvania and identify specific barriers faced in practicing sun safety. **Methods:** We conducted a convenience sample survey at the largest indoor agriculture exposition in the country (Pennsylvania Farm Show). The survey, based on established measures, assessed sun protection practices among agricultural industry workers using a 2-page questionnaire covering demographics, sun protection habits, barriers, and skin examination history. Exclusion criteria included not identifying as an agricultural industry worker, age under 18, and inability to read and understand English. Descriptive statistics, chi-squared tests, and multivariable logistic regression, controlling for age, gender, education, skin tone, previous skin cancer diagnosis, and occupational sector, were employed in analysis. **Results:** The response rate was 86%, with 7 of 202 surveys excluded (n = 195). Regarding sun exposure knowledge, 63.1% believed their skin cancer risk was higher than indoor workers, and 80.0% perceived unprotected sun exposure as harmful. However, 71.8% reported infrequent sunscreen use. The most common barrier to sun protection was forgetting (49.2%), and 59.0% noted their workplace lacked built-in sun protection. Regression models revealed lower education, darker skin tones, and male gender as significant predictors of underestimating sun exposure risks (p < .01). Men were less likely than women to discuss sun protection with their primary care providers, undergo skin checks, or receive sun protection information from healthcare providers (p < .05). Additionally, men were less likely than women to regularly wear and reapply sunscreen but more likely to wear hats of any type (p < .05).
Conclusion: Despite awareness of skin cancer risk, reported sun protection usage among agricultural industry workers in Pennsylvania was inconsistent, highlighting the need for interventions tailored to addressing barriers like forgetfulness. This study compares sun protection practices between occupational sectors within agriculture. Future qualitative research studies focusing on specific sectors and their unique practices are crucial for developing tailored messaging strategies and targeted, workplace-based interventions.
Moeckel et al. 2025.
Journal of Agromedicine, vol. 30, no. 3.

Keywords: Agricultural workers; UV radiation; skin cancer; sun protection; sunscreen.
Evidence Level: 4B
Link: https://pubmed.ncbi.nlm.nih.gov/40000927/

Chronic Health Issues

Prevalence of occupational respiratory disease and its determinants among workers in major industrial sectors in Malaysia in 2023

In Malaysia, rapid industrial growth has increased workers' exposure to occupational respiratory hazards which consequently leads to an increase in the prevalence of occupational respiratory disease (ORD)

among workers. Therefore, this study aims to fill this gap by investigating the prevalence of ORD and its determinants among workers. This is a cross-sectional study utilizing secondary data from the National Occupational Disease and Prevention 2023 (NODIP) database involving a total of 111,028 participants. Suspected ORD was defined by the British Medical Research Council (BMRC) questionnaire criteria. Both descriptive and inferential statistics were utilized in this study. Multivariable logistic regression analysis was used to find the determinants of ORD. The overall prevalence of ORD was found to be 8.7%. Most of studied factors were significant determinants of ORD. However, the factors of highest odds ratio (OR) were working in the mining and quarrying (AOR: 14.81; 95% CI: 11.74-18.68; $p < 0.001$), being of Malaysian nationality (AOR: 4.48; 95% CI: 3.78-5.32; $p < 0.001$) and working more than 12 hours per day (AOR: 2.18; 95% CI: 1.94-2.45, $p < 0.001$). The findings of this study highlight the importance of regular assessment of the risk of exposure to noxious agents in the workplace and to develop measures for preventing potential adverse effects.

Asraff et al. 2025.

Scientific Reports, vol. 15, no. 1.

Keywords: Determinants; major industrial sectors; malaysia; occupational respiratory disease; prevalence.

Evidence Level: 4B

Link: https://www.nature.com/articles/s41598-025-10365-8

Assessing the burden of dermatological diseases on work life from a gender perspective

This study investigates the impact of dermatological diseases on work activity, with a particular focus on potential gender differences. The primary objectives are to evaluate the severity of these conditions and their implications for job performance, productivity, and non-work-related daily activities. A cross-sectional analysis was conducted on employed patients with dermatological conditions between September 2021 and November 2023. Participants completed a new self-reported survey, including the Dermatological Diseases Work Impact Questionnaire (2DWIQ), along with two validated tools: the Work Ability Score (WAS) and the Work Productivity and Activity Impairment questionnaire. Participants were stratified by occupational category (blue- and white-collar workers). Statistical analyses were adjusted for factors influencing questionnaire outcomes, and the internal reliability of the 2DWIQ was assessed using Cronbach's α. The study included 417 participants (231 men and 186 women) affected by a dermatological disease primarily atopic dermatitis, psoriasis, and hidradenitis suppurativa. Women reported significantly higher levels of absenteeism, overall work impairment, and activity impairment compared to men. Additionally, they had lower WAS scores, indicating poorer work ability. Dermatological diseases have a greater impact on women, affecting both their work performance and daily lives. Gender-specific interventions are crucial to reducing the physical and psychological burden of these conditions and improving occupational health management.

Padovan et al. 2025.

Scientific Reports, vol. 15, no. 1.

Keywords: Dermatological diseases; gender differences; occupational health; white- and blue-collar workers; work ability; work productivity.

Evidence Level: 4B

Link: https://www.nature.com/articles/s41598-025-07804-x

Occupational Exposure

Global, regional and country-specific burden of larynx cancer due to occupational exposure to asbestos: A systematic analysis of the Global Burden of Disease Study 2021

Background: Laryngeal cancer (LC) attributable to occupational asbestos exposure remains a significant global health concern. This study aimed to assess the global burden of LC caused by asbestos exposure using data from the Global Burden of Disease (GBD) 2021 study. **Methods:** Data from the Global Burden of Diseases study 2021 were used to analyse the global burden of LC, including incidence, mortality,

prevalence, and disability-adjusted life years (DALYs) from 1990 to 2021. The study employed age-standardized rates (ASR) for comparison. Trend analysis was performed using annual percentage change (EAPC) to examine temporal changes in LC burden. Bayesian age-period-cohort modelling was utilized to project future trends from 2022 to 2046. **Results:** In 2021, the global burden of LC attributable to occupational asbestos exposure was 3,392 deaths and 66,909 DALYs. The burden was significantly higher in males compared to females. The age-standardized mortality rate was highest in high-SDI regions, but low- and middle-SDI regions showed increasing trends. From 1990 to 2021, global LC mortality and DALYs decreased, with a notable reduction in high-income countries, while many low- and middle-income countries experienced either stable or rising trends. Projections indicate continued decline in high-income countries but persistent or increasing burden in lower-income regions. **Conclusion:** This study highlights the ongoing global disparities in the burden of LC due to occupational asbestos exposure. While high-income countries have made significant progress in reducing this burden, low- and middle-income countries continue to face challenges due to ongoing asbestos use.

Zhang et al. 2025.

BMC Public Health, vol. 25, no. 1.

Keywords: Asbestos exposure; Bayesian modeling; global burden; laryngeal cancer; occupational health; sociodemographic index; trend analysis.

Evidence Level: 1A

Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23343-6

Occupational benzene exposure and skin cancers: A systematic review and meta-analysis

Background: Exposure to benzene is a widespread occupational hazard that has been associated with haematopoietic neoplasms. The increasing awareness of the health effects that can arise from extended dermal contact with aromatic hydrocarbons, such as benzene, may elevate the risk of skin cancer. **Aims:** This study addresses the association between occupational benzene exposure and its incidence and mortality, encompassing non-melanoma skin cancer (NMSC), including basal cell carcinoma and squamous cell carcinoma, as well as cutaneous melanoma (CM). **Methods:** After removing duplicates, we screened 5652 articles from four different sources (Embase, PubMed, Scopus and IARC Monographs), retrieving 29 independent studies on occupational benzene exposure and skin cancer. The meta-analysis used a random-effects model, overall and stratifying by gender, publication year, outcome, geographic region, industry type and study design. **Results:** The analysis encompasses 18 risk estimates on CM and 21 on either NMSC or not-specified skin cancer (NM/NS) mostly from Europe and North America and predominantly from oil industry cohorts. There was no association with either CM (relative risk [RR] = 0.99, 95% confidence interval [CI] 0.81; 1.21) or NM/NS (RR = 1.19, 95% CI 0.94; 1.50), except for a positive association between employment in the chemical industry and NM/NS risk. There was no evidence of publication bias for either type of cancer (P = 0.70 and P = 0.08). **Conclusions:** Our meta-analysis found no association between occupational benzene exposure and skin cancer. Further research should aim to describe the association of benzene exposure with skin cancer in less developed countries and among various occupations.

Angelini et al. 2025.

Occupational Medicine, vol. 75, no. 3.

Keywords: Benzene exposure; skin cancer; occupational hazard.

Evidence Level: 1A

Link: https://academic.oup.com/occmed/article/75/3-4/163/8046185?login=false

The association between occupational silica exposure and leukemia: A systematic review and meta-analysis of cohort studies

Respirable crystalline silica is a proven lung carcinogen, but there is limited information of the carcinogenic effects of silica on non-respiratory organs. We aimed to systematically review cohort studies and conduct a meta-analysis to explore the relationship between occupational exposure to silica and the risk of leukemia development. We performed an exhaustive search across three databases (PubMed, Embase, and Web of

Science) to identify pertinent cohort studies published since 1987. After removing duplicates and excluding irrelevant studies, 22 studies were included in our analysis. We utilized fixed-effects models in the implementation of our meta-analysis. The combined relative risk of leukemia associated with occupational silica exposure was determined to be 1.11 (95% CI: 0.93-1.33), with no significant differences observed across various industries, geographic regions, exposure periods, or study quality estimates. The present study based on cohort studies provide no evidence that occupational exposure to silica does increase the risk of leukemia.

Shao et al. 2025.

BMC Public Health, vol. 25, no. 1.

Keywords: Leukemia; meta-analysis; occupational exposure; silica.

Evidence Level: 1A

Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23384-x

Occupational radiation exposure and thyroid nodules in healthcare workers: A review

Thyroid nodules are a common clinical finding, with their prevalence influenced by multiple environmental and occupational factors, including exposure to ionizing radiation. Healthcare workers, particularly those operating in radiology, nuclear medicine, interventional cardiology, and radiation oncology, are potentially at increased risk due to chronic low-dose radiation exposure. This review aims to evaluate the current evidence regarding the association between occupational radiation exposure and the development of thyroid nodules among healthcare professionals. The findings suggest a higher prevalence of thyroid nodules in radiation-exposed workers compared to the general population, although data heterogeneity and methodological limitations exist. Factors such as the duration of exposure, radiation protection practices, and frequency of monitoring play critical roles in modulating the individual risk. While some studies report no significant difference in malignancy rates, the increased detection of nodules underlines the need for regular thyroid surveillance in at-risk populations. Further longitudinal and multicentric studies are warranted to clarify the causality and guide preventive strategies. This review highlights the importance of occupational health protocols, including radiation shielding and periodic thyroid evaluation, in safeguarding the long-term endocrine health of healthcare workers.

Andreadi et al. 2025.

International Journal of Molecular Sciences, vol. 26, no. 13.

Keywords: Healthcare workers; prevalence and radiation safety; radiation exposure; thyroid nodules.

Evidence Level: 1B

Link: https://www.mdpi.com/1422-0067/26/13/6522

Global health burden and inequality patterns of occupational noise exposure from 1990 to 2019

Exposure to occupational noise has emerged as a major health issue worldwide. To better evaluate changes in the health impacts of occupational noise exposure from 1990 to 2021, this study conducted stratified analyses of spatiotemporal variations across regions, genders, age, and sociodemographic index (SDI) levels. Results indicate that low-income and rapidly industrializing countries bear higher burdens of occupational noise-related diseases. Males and middle-aged to elderly populations are the primary high-risk groups for occupational noise exposure, with a particularly notable increase in the burden among those aged 45-74. Disability-adjusted life years (DALYs) significantly decreased with increasing SDI, while estimated annual percentage change (EAPC) showed significant positive correlations with both DALYs (R = 0.3) and SDI (R = 0.4). Regions with an SDI of 0.4-0.6 experienced the most pronounced EAPC growth. By 2035, DALYs rates are projected to decrease to 125.0 ± 1.9 per 100,000, although the burden for individuals aged 65 and above is expected to increase significantly. Population growth and aging were identified as key drivers of DALYs increases, contributing 68.2% and 20.9%, respectively. From 1990 to 2021, the slope inequality index changed from - 9.6 to 2.5, and the concentration index curve became smoother. Although health inequality has improved, the disease burden in low-SDI countries remains significantly higher than theoretical minimum levels. This study provides robust support for reducing global occupational noise exposure and its associated health inequalities.

Wang et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: Age-period-cohort analysis; disability-adjusted life years; efficiency frontier model; health inequality; occupational noise; population aging and growth.
Evidence Level: 4A
Link: https://www.nature.com/articles/s41598-025-09575-x

Associations among blood heavy metals, neurofilament light chains and cognition function in US adults: NHANES 2013-2014

Background: Heavy metals could induce neurotoxicity, leading to cognitive function and motor deficiencies. Serum neurofilament light chain (sNfL) is a promising biomarker for neurological injury, and it may indicate nerve damage from heavy metals exposure. However, there's limited research exploring the associations among heavy metals, sNfL, and cognitive function in adults, and the existing findings are inconsistent. **Objective:** 959 participants were enrolled from the National Health and Nutrition Examination Surveys (NHANES) 2013-2014. This study was aimed to investigate the possible associations among heavy metals, sNfL, and cognitive function in adults. **Methods:** We utilized data from the National Health and Nutrition Examination Survey (NHANES) 2013-2014, comprising 959 participants. Heavy metals were detected in blood samples including lead (Pb), cadmium (Cd), mercury (Hg), manganese (Mn), and selenium (Se), with measurements taken using Inductively Coupled Plasma Mass Spectrometry (ICP-MS) technology. The level of sNfL was quantified via an innovative high-throughput immunoassay technology developed by Siemens Healthineers. Cognitive function were assessed using the Animal Fluency Test (AFT), the Consortium to Establish a Registry for Alzheimer's Disease (CERAD), and the Digit Number Symbol Substitution Test (DSST). Additionally, generalized linear models (GLMs), weighted quantile sum regression (WQS), Bayesian kernel machine regression (BKMR), quantile-based g computation (qgcomp), and restricted cubic splines (RCS) analyses were employed to examine the associations between heavy metals exposure and sNfL level. Finally, a mediation analysis to explore the interaction among heavy metals, sNfL, and cognitive function in adults aged 60 and above. **Results:** The generalized linear models exhibited a positive correlation between blood Pb or Cd levels and sNfL (β = 0.14, 95 % CI: 0.08-0.20; β = 0.14, 95 % CI: 0.07-0.20), in total population. Both WQS and BKMR analysis consistently showed a strong correlation between higher levels of the blood heavy metals mixture and increased sNfL (OR=0.051, 95 %CI: 0.025-0.090). The qgcomp model indicated that Cd had a significant positive correlation with sNfL, while Mn and Se showed a significant negative correlation with sNfL. Moreover, we have identified a significant relationship between sNfL or Cd and cognitive function scores (AFT, DSST) in adults aged 60 and above. The mediation analysis further revealed that sNfL partially mediated the relationship between Cd and AFT or DSST scores, with interpretive efficiencies of 23.35 % and 32.7 %, respectively. **Conclusion:** This study is the first to utilize sNfL data to establish a link between heavy metals exposure and cognitive function. The finding highlight the positive correlation between Pb or Cd and sNfL, the negative correlation between Se and sNfL. The impact of Cd exposure on cognitive function in individuals older than 60 was partially explained by sNfL. Further investigations are required to validate these findings, considering the constraints of the NHANES study.
Zhou et al. 2025.
Ecotoxicology and Environmental Safety, vol. 299.

Keywords: Cadmium; cognitive function; heavy metals; NHANES; Neurofilament light chain.
Evidence Level: 4B
Link: https://www.sciencedirect.com/science/article/pii/S0147651325007055?via%3Dihub

Short- and long-term exposure to ambient air pollution and greenness in relation to pulmonary tuberculosis incidence

Epidemiological studies have found inconsistent relationships between air pollutants and the risk of pulmonary tuberculosis (PTB), possibly due to variations in exposure windows and limited attention to environmental modifiers such as greenness. However, few studies has systematically examined how short-

and long-term exposure to air pollution may differentially impact PTB risk, and how greenness may modify these associations. We utilized comprehensive data, including daily PTB incidence, air pollutants, meteorological data, and the normalized difference vegetation index (NDVI) from Zhejiang Province, China, spanning from 2013 to 2019. A distributed lag nonlinear model (DLNM) was employed to examine the relationships between air pollution and PTB incidence by county, and a meta-analysis was conducted to aggregate county-specific estimates. In the single-pollutant model, the lag-specific excess risk (ER) of PTB was 0.7% (95% CI 0.05%, 1.4%, 13-week lag) for each 0.1 mg/m^3 increase in carbon monoxide (CO). For each 10 μg/m^3 increase in the combined oxidant capacity (O_X), the lowest risk was a 0.9% decrease (95% CI -1.5%, -0.3%, 16-week lag). For each 10 μg/m^3 increase in particulate matter 2.5 ($PM_{2.5}$), the highest risk was a 1.7% increase (95% CI 0.8%, 2.6%, 19-week lag). Conversely, each 10 μg/m^3 increase in sulfur dioxide (SO_2) showed a dual association with PTB incidence, encompassing a short-term negative correlation and a long-term positive correlation. Furthermore, the associations between CO and $PM_{2.5}$ and PTB incidence were more pronounced in the male and working-age subgroups, whereas the associations with SO_2 were more significant in the female and elderly subgroups. Additionally, we observed that greenness negatively modified the relationship between short- and long-term exposure to O_X and PTB incidence. Our findings revealed significant long-term lagged effects of CO, O_X, and $PM_{2.5}$ on PTB incidence, as well as short- and long-term lagged effects of SO_2. Furthermore, greenness was identified as a modifier of the association between O_X and PTB incidence at various lag times.

Yuan et al. 2025.

Scientific Reports, vol. 15, no. 1.

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Keywords: Air pollutants; greenness exposure; lag effects; modification effects; pulmonary tuberculosis**.**

Evidence Level: 4B

Link: https://www.nature.com/articles/s41598-025-11465-1

Association between organophosphorus pesticide exposure and the prevalence of kidney stones in US adults: A population-based study

It has been demonstrated that exposure to glyphosate (GLY) may result in the development of a number of diseases. The objective of this study was to ascertain whether there is a correlation between GLY exposure and the risk of developing kidney stones in adults residing in the United States. A cross-sectional study was conducted on 4178 patients from the 2013 to 2018 National Health and Nutrition Examination Survey. To explore the association between GLY exposure and the risk of developing kidney stones, dose-response analysis curves with restricted cubic barplots, logistic regression, propensity score matching, and subgroup analyses were employed. Of the 4178 participants, 443 self-reported having kidney stones. After adjusting for sex, age, race, education level, marital status, body mass index, hypertension, diabetes mellitus, recreational activities, and smoking and drinking status, we found that GLY exposure was positively associated with the risk of kidney stone prevalence. The patients were divided into 4 groups based on quartiles of urinary GLY levels and a logistic regression analysis was performed after adjusting for potential confounders. This analysis demonstrated a positive association between GLY exposure and the risk of kidney stones when compared with Q1 (OR = 1). The results indicated that the risk of developing kidney stones increased with increasing urinary GLY concentrations. The present study found a positive association between urinary GLY levels and the risk of developing kidney stones. This association can be prevented by reducing occupational exposure to GLY.

Peng et al. 2025.

Medicine, vol. 104, no. 28.

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Keywords: National Health and Nutrition Examination Survey; a cross-sectional survey; glyphosate; kidney stones.

Evidence Level: 4B

Link: https://journals.lww.com/md-journal/fulltext/2025/07110/association_between_organophosphorus_pesticide.8.aspx

High metabolic activity in positron emission tomography and systemic inflammation occurring years after exposure cessation in engineered stone silicosis

Engineered stone silicosis is an interstitial lung disease that progresses rapidly; in many cases, it can cause respiratory insufficiency and death. The metabolic activities occurring in the lungs and adenopathies, as well as their relationships with systemic inflammation, are unknown. Patients with complicated silicosis were enrolled in this study. All of the patients had worked for at least 5 years in finishing and installing engineered stone and had not been exposed to these working conditions for at least 7 years. Clinical data measurements, positron emission tomography/computed tomography using ^{18}F-fluorodeoxyglucose (^{18}F-FDG PET/CT), respiratory function tests and blood samples were performed. The mean age of the patients was 44 ± 5.4 years. Moreover, the average exposure duration was 10.94 ± 3.2 years, and the average number of years from cessation of exposure was 11.6 ± 1.6 years. The average maximum standardized uptake value (SUVmax) of large opacities was 6.32 ± 3. All of the patients demonstrated hypermetabolic mediastinal lymphadenopathies, and 88.2% of the patients also demonstrated extra thoracic lymphadenopathies. The SUVmax of the large opacities was correlated with fibrinogen (ρ = 0.717, P = 0.001), the lymphocyte-to-monocyte ratio (ρ = - 0.506, P = 0.038), the systemic inflammatory response index (ρ = 0.559, P = 0.02) and CD4$^+$NKT cells. Large areas of lung opacity and lymphadenopathies exhibited high metabolic activities years after the cessation of silica exposure. The relationships between metabolic activity and several inflammatory factors may lead to the exploration of new therapeutic targets.

León-Jiménez et al. 2025.

Scientific Reports, vol. 15, no. 1.

Keywords: Engineered stone; lymphocyte subsets; positron emission tomography; silicosis; systemic inflammatory indices.

Evidence Level: 4B

Link: https://www.nature.com/articles/s41598-025-10562-5

The effect of recurrent mobility on air pollution exposure and mortality burden in Catalonia

Background: Air pollution exposure is a leading health risk mainly due to its detrimental respiratory and cardiovascular effects. Ambient air quality varies greatly across time and space, most anthropogenic pollutants being higher in cities than rural areas. Residents of rural areas who commute to cities for work are also exposed to the air pollution there. Therefore, exposure assessments that neglect population mobility produce biased estimates. **Methods:** In this study, we quantify the effect of recurrent mobility on long-term air pollution exposure and its attributable mortality for the pollutants NO 2 , O 3 , PM 2.5 and PM 10, for 584 districts of Catalonia (Spain) in 2022. We use anonymized phone-based mobility data to infer the dynamic distribution of the residents of each district among the different areas, considering only recurrent mobility. We also utilise finely resolved air quality data for the four pollutants from the bias-corrected CALIOPE model, projected over the districts. We integrate dynamic population with the air quality to calculate dynamic exposure estimates and compute the effect of mobility on long-term exposure with respect to the static estimates. We also calculate the mortality attributable to each pollutant and the effect of mobility. **Results:** Considering the four pollutants, between 75.9% and 86.3% of the districts present significant effects of mobility on exposure. Rural areas surrounding cities display increased exposures to NO 2 , PM 2.5 and PM 10 , and decreased exposures to O 3 . The magnitude of these effects stays under 1 µ g/m 3 when considering the complete populations, but they increase up to 8.3 µ g/m 3 of change when we focus on the mobile populations. However, the effects on attributable mortality are negligible. **Conclusions:** Our work evidences the impact of cities on the air pollution exposure of people living far away from them, made possible by recurrent mobility. Our results show that correcting exposure profiles by mobility might not have a large impact at the population level when inter-area mobility is relatively low but can be very significant for individuals and population segments with specific mobility habits, and as such should be taken into account for the design of public health policies.

Navarro-Martínez et al. 2025.

International Journal of Health Geographics, vol. 24, no. 1.

Keywords: Air pollution; attributable mortality; dynamic population; exposure assessment; human mobility; mobile phone data.
Evidence Level: 4B
Link: https://ij-healthgeographics.biomedcentral.com/articles/10.1186/s12942-025-00410-0

Incidence of metabolic syndrome among radiation workers exposed to low dose radiation: A national cohort study in Korea

Background: Radiation exposure may increase the risk of metabolic syndrome (MetS). However, evidence regarding low-dose exposure remains scarce. This study investigated the link between occupational radiation exposure and MetS incidence among Korean radiation workers. **Methods:** We analyzed a national cohort of 129,802 Korean radiation workers enrolled in the National Dose Registry between 1984 and 2017, with follow-up based on a linked National Health Information Database. MetS was defined according to the criteria of the American Heart Association, as adapted by the Korean Society for the Study of Obesity. Standardized incidence ratios were calculated to compare the incidence of MetS between radiation workers and the general population. Poisson regression models were used to estimate relative risks and excess relative risks by radiation dose, after adjusting for sociodemographic and lifestyle factors. **Results:** Of the 129,802 workers, 40,369 (31.1%) developed MetS. The standardized incidence ratio was 0.85 [95% confidence interval: 0.84, 0.86], indicating a lower incidence than that in the general population; however, non-destructive testing workers with poor lifestyle factors had a relatively higher risk of MetS than those in other occupations. Across the cohort, an increased risk of MetS associated with radiation doses was not observed with adjustment for sociodemographic and lifestyle factors, while it varied depending on sex, lag periods, and duration of employment. **Conclusions:** Overall, low MetS risk was observed among radiation workers. However, outdoor field workers frequently exposed to elevated levels of radiation should minimize high-risk behaviours-such as smoking and alcohol consumption, known risk factors for MetS or other occupational diseases. Further study is needed to investigate a more sophisticated dose-response association with the incidence of Mets through long-term follow-up, considering relevant organ dose and a latent period as well as pre-existing components of MetS before radiation exposure.
Noh et al. 2025.
BMC Public Health, vol. 25, no. 1.

Keywords: Metabolic abnormalities; prevention; radiation exposure; risk factors.
Evidence Level: 4B
Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23543-0

Impact of air recirculation and humidification systems on wood dust exposure during woodworking

Employees in the woodworking industry, including carpentry workshops, wood product factories, and the wooden house industry, are exposed to wood dust at work. In Norway, this industry is exempt from regulations banning air recirculation, intended to prevent harmful substance buildup in working environments. While wood dust exposure is linked to increased risks of cancer and respiratory diseases, eliminating the exemption could have significant economic consequences for companies reliant on heated air recirculation during winter. A detailed characterization of the exposure is needed to evaluate the health risks associated with recirculated air. Wood dust contains components like resin acids, endotoxins, fungi, bacteria, monoterpenes, and aldehydes, which can irritate the skin, eyes, and respiratory system. Understanding these exposures is crucial for evaluating whether existing occupational exposure limits (OELs) adequately protect workers' health. This study aimed to assess wood dust and associated exposures in companies with and without air recirculation or humidification. Between 2019 and 2023, full-shift personal aerosol sampling was conducted in 23 companies during winter. Samples were analysed for wood dust mass, endotoxin, bacteria and fungi, resin acid, monoterpenes, and aldehydes. Log-transformed exposure data were analysed by mixed models using company types and work-related conditions as fixed effects. Results showed average exposure below OELs but with significant variability. About 25% of measurements exceeded the OEL for inhalable wood dust of 1 mg/m3. Air recirculation had mixed effects;

it lowered the monoterpene exposure by 95% (from GM 597 µg/m3 to GM 27 µg/m3) but increased the GM microbial exposure 2 to 5 times across companies. The impact of air recirculation varied across company types. For building element production, it nearly doubled the wood dust exposure from soft woods (from GM 0.15 mg/m3 to GM 0.27 mg/m3), while for door/window manufacturers, exposure was nearly halved compared to those not using air recirculation (from GM 0.44 mg/m3 to GM 0.25 mg/m3). Air humidification lowered the inhalable dust exposure by 59% across the company (from GM 1.36 mg/m3 to 0.56 mg/m3) but led to increases in monoterpene by 90 % (from GM 86 µg/m3 to GM 792 µg/m3) and microbial exposure by up to 64%. Companies manufacturing interior products without a humidification system had resin acid exposure levels that were 10 times higher (GM 3323 ng/m3) compared to those with a humidification system (GM 344 ng/m3). The variability in exposures was mostly influenced by company-specific practices. Evaluation of preventive measures should therefore be tailored to the individual company.

Straumfors et al. 2025.

Annals of Work Exposures and Health, vol. 69, no. 6.

Keywords: Endotoxins; hardwood dust; microbial exposure; monoterpenes; resin acids; softwood dust.

Evidence Level: 4B

Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC12262046/

Transcriptomics insight into occupational exposure to engineered nanoparticles

Aim: To investigate the effect of acute (daily) inhalation of nanoparticles (NPs) on the transcriptomic profile of male nanocomposite research workers with a history of long-term exposure (years). **Materials & methods:** Whole genome mRNA and miRNA expression changes were analysed from blood samples collected before and after machining or welding. Exposure in the work environment was assessed using stationary and personal monitoring. **Results:** Following PM0.1 exposure, a significant decrease in the expression of *DDIT4* and *FKBP5*, genes involved in the stress response, was detected in exposed workers. In the Machining group, the *DDIT4* expression correlated with the exposure dose. Increased levels of miR30-d-5p and miR-3613-5p (both involved in carcinogenesis) in welders were associated with the NP exposure dose, highlighting their potential suitability as inhalation exposure markers. **Conclusion:** The results from this pilot transcriptomic analysis (mRNA and miRNA) indicate that exposure to NPs contributes to immune system deregulation and alters the pathways related to cancer. Therefore, the use of protective equipment, as well as obtaining more data by additional research, is highly recommended.

Simova et al. 2025.

Nanomedicine, vol. 20, no. 14.

Keywords: Occupational exposure; machining; nanoparticles; transcriptome changes; welding.

Evidence Level: 5B

Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC12239771/

Risk perception, barriers, and working safely with silica dust in construction: A psychological network approach

Background: In the construction industry workers are frequently exposed to hazardous substances. To explore and describe construction workers' barriers and motives to (not) work safely with hazardous substances, we examined their perspectives on the health risks, perceived barriers, and intention to use preventive measures with regard to silica dust. Specifically, we studied perspectives on the use of face masks, dust collection on power tools, and using a vacuum cleaner instead of a broom. **Method:** Semi-structured interviews (n = 13) and a pen and paper survey (n = 187) were administered on construction and training sites. Only executive workers could participate in the study. We approached the behaviour of using specific preventive measures as an emergent property of a complex network of interacting psychological variables. To analyse the structure of these 'behavioural decision networks' we applied a psychological network. **Results:** Through the exploratory semi-structured interviews, we identified themes relevant for our survey, like perceived exposure, risk being considered as part of the job, and perceived barriers like

time, effort, and properties of the work environment. Construction workers were generally aware their health is at risk due to occupational exposure to silica dust. At the same time, they are not overly concerned about that risk. Network analysis suggests that concern does play a moderate role in the behavioural decision networks, suggesting that a lack of concern may encourage unsafe behaviour. Construction workers' level of automaticity to use specific preventive measures was relatively low. Barriers to use preventive measures such as time and effort play a relatively key role in the networks. A general intention to work safely hardly played any role in the networks, while a specific intention to use preventive measures played a more prominent role. Age and work experience did not play a role in the network. Non-parametric tests and descriptive comparison of networks suggest differences in for example the relative importance of specific variables. **Conclusions:** For two preventive measures, different variables may be more successful intervention points to foster safe work. Increasing levels of concern, improving automaticity of use, addressing specific intention to use preventive measures in risk communication, and offering preventive measures at time and location where relevant tasks are performed, are discussed as possible intervention points to foster working safely with silica dust in construction. Future studies should further substantiate these findings.

Jansen et al. 2025.

BMC Public Health, vol. 25, no. 1.

Keywords: Behaviour; construction; occupational health and safety; preventive measures; psychological network analysis; risk communication; risk perception; silica dust.

Evidence Level: 5B

Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23347-2

Characterization of dust and crystalline silica exposure during indoor demolition

Exposure to dust and respirable crystalline silica (RCS) is a continuing concern in the construction industry when working with silica-containing materials, such as concrete, brick, or stone. Increased knowledge of the dust characteristics can be used to improve measures to reduce potential exposure. This study aimed to characterize dust collected from indoor demolition in terms of particle size distribution and mineral content, including quartz. Airborne dust was collected with Sioutas cascade impactors at five different construction sites involved in indoor demolition and renovation. Four of the locations had workers demolishing concrete, while at the fifth location brick structures were demolished. An aerodynamic particle sizer (APS) was used to continually monitor the particle number concentrations in the size range 0.54 µm to 17 µm. Material samples of demolished material were collected from each location to determine mineral content. The filters from the Sioutas cascade impactors were weighted to determine dust concentrations in five size fractions ranging from 10 µm down to less than 0.25 µm. Quartz concentrations were quantified with X-ray diffraction using the NIOSH 7500 method and Rietveld refinement was further used to determine other mineral content in the Sioutas impactor samples and material samples. Respirable dust and quartz concentrations were calculated from the Sioutas data. The mass- and number-based particle size distributions measured by the APS were similar for the four locations involved in concrete demolition, whereas the location working with brick had a different distribution. The concentration levels varied widely, and the highest levels were observed at an enclosed location with no natural ventilation where concrete demolition took place. Limited natural or mechanical ventilation led to an accumulation of smaller particles around 1 µm and a lower mass median aerodynamic diameter for RCS, down to 1.2 µm, compared to locations with ventilation. The quartz percentages of the dust collected by Sioutas impactors were found to increase with increasing particle size. The dust contained less quartz than the source material, and an up-concentration of softer minerals like calcite was observed. The knowledge of particle size distributions and concentration levels occurring in the field during indoor demolition is important to ensure effective measures to reduce worker exposure. The results highlight the importance of effective ventilation to reduce the accumulation of airborne particles.

Halvorsen et al. 2025.

Annals of Work Exposures and Health, vol. 69, no. 6.

Keywords: RCS; Rietveld refinement; XRD; dust concentration; mineral content; quartz; renovation; respirable crystalline silica; size distribution.
Evidence Level: 5B
Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC12262043/

Occupational exposure to heavy metals and its association with DNA oxidative stress among urban green space workers

Heavy metals impact the urban population, the environment, and workers exposed to these pollutants. Green space workers during the day shift and peak city traffic hours have constant exposure to air pollutants. This study aimed to determine the concentration of heavy metals including, Cd, Co, and Zn in urine and breathing air samples among green space workers as the exposed group and office employees as the control group of Tehran Municipality and investigate the associations between heavy metal exposure and DNA oxidative stress. In addition, a comparative analysis was conducted between those groups. NIOSH-7300 and NIOSH-8310 were used to collect and prepare air and urine samples. The final sample concentration was measured by ICP-OES. ZellBio GmbH kits were used to measure the levels of urinary 8-OHDG (8-hydroxy-2'-deoxyguanosine), a biomarker of DNA oxidative stress. The mean concentration of urinary and air heavy metals and urinary 8-OHDG, except for Cd in the air, exhibited a statistically significant increase in the exposed group compared to the control group ($P < 0.001$). Moreover, the Pearson correlation coefficient (R) between urinary heavy metals and 8-OHDG values in the exposed group revealed that there are significant relations between urinary Cd, Co, and Zn with 8-OHDG: $R = 0.734$, $R = 0.836$, and $R = 0.584$ respectively ($P < 0.001$). No correlations were observed between heavy metals and 8-OHDG in the control group. Findings revealed that cobalt and cadmium exhibit the most significant influence on changes in oxidative stress, as indicated by the dependent variable 8-OHDG. This study compared urban green space workers with office employees, revealing elevated concentrations of Cd, Co, and Zn in the air and urine of the exposed group. Green space workers exhibited significantly higher urinary 8-OHDG, indicating increased DNA oxidative stress. The findings highlight the urgent need for protective measures and occupational health interventions for green space workers.
Ahmadi Jalaldehi 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: 8-OHDG; green space; heavy metals; occupational health; oxidative stress; Tehran.
Evidence Level: 5B
Link: https://www.nature.com/articles/s41598-025-05444-9

Impact of wildfire emissions exposure on the associations between levels of lung injury, lipid peroxidation, DNA oxidation, and exposure biomarkers

Firefighters face increased risks of developing cardio-respiratory diseases and cancer. This study aimed, for the first time, to simultaneously characterize several biomarkers of effect (lung injury by Clara cell 16 - CC16, lipid peroxidation by 8-isoprostane-8-iso, and DNA oxidation by 8-hydroxy-2-deoxyguanosine-8-OHdG) and exposure (polycyclic aromatic hydrocarbons metabolites - 6 OHPAHs and 17 metal(loid)s) in (pre- and post-exposure) paired urine samples of wildland firefighters, while exploring their inter-/intra-associations and accounting for tobacco consumption. Wildfire combat influenced the levels of CC16 (+39 %), 8-iso (+33 %), 8-OHdG (-13 to +19 %), individual and sum of OHPAHs (+75-211 %), and metal(loid)s (up to 43 %, $p > 0.05$: lithium, zinc, antimony, and lead); post-exposure increments were more evident among non-smokers. Post-exposure (individual and sum) OHPAHs and some metal(loid)s (copper, cadmium, barium, antimony, copper, lead, zinc, selenium, and rubidium) were positively associated with CC16, 8-iso and/or 8-OHdG ($0.609 < r < 0.838$; $0.001 < p < 0.047$). Spearman's correlations and principal component analysis highlighted CC16 as the best discriminant effect biomarker of wildland firefighting, correlating positively with individual and sum of OHPAHs, cadmium, barium and copper ($0.647 < r < 0.764$; $0.006 < p < 0.031$). Cumulative exposure to wildfires and tobacco contributed to positive correlations ($0.587 < r < 0.715$; $0.009 < p < 0.045$) between lipid peroxidation and arsenic, antimony, lead, and copper, and between DNA oxidation and lead. Smoking firefighters presented higher OHPAHs baseline concentrations (2- to 14-fold), and lung injury and DNA oxidation induced by cadmium, copper, strontium, cesium, barium and

thallium ($0.661 < r < 0.709$; $0.022 < p < 0.038$). Given firefighter's carcinogenic risks, performing similar studies in larger groups is crucial to enhance risk assessment by establishing a well-defined panel of effect and exposure biomarkers.

Barros et al. 2025.

Science of The Total Environment, vol. 993.

Keywords: Biomarkers of effect; firefighters; hydroxylated polycyclic aromatic hydrocarbons; metals and metalloids; occupational health.

Evidence Level: 5B

Link: https://www.sciencedirect.com/science/article/pii/S0048969725016523?via%3Dihub

Occupational radiation exposure of therapists in clinical use of spot scanning proton-carbon ion synchrotron systems

This study addresses the escalating radiation safety concerns among medical professionals due to the rising application of proton and carbon ion radiotherapy. It evaluates the occupational radiation exposure faced by therapists when utilizing the Siemens IONTRIS Proton-Carbon Ion System. Through random sampling of 80 patients treated between January and June 2024, we recorded particle types and counts and measured dose rates using a photon/neutron radiation dose meter. Notably, 1 min post-treatment, the dose rate peaked at 16.00 µSv/h near the tumour's skin surface, showing a significant correlation with particle count. The therapist's standing position and the surfaces of the range shifter and ripple filter registered average dose rates of 1.25 µSv/h and 3.63 µSv/h, 0.33 µSv/h, respectively. Other points averaged 0.08 µSv/h, with no neutron detection. The study concludes that the annual average occupational exposure for therapists, at ~300 µSv, is significantly below the International Commission on Radiological Protection's recommended dose equivalent limit, confirming the safety of the Siemens IONTRIS device in clinical settings.

Liu et al. 2025.

Journal of Radiation Research, vol. 66, no. 4.

Keywords: Carbon ion therapy; occupational exposure; proton therapy; radiation protection; siemens IONTRIS.

Evidence Level: 3B

Link: https://academic.oup.com/jrr/article/66/4/365/8154124?login=false

Association between size-resolved PM(10)-bound heavy metal and metalloid exposure and oxidative stress among waste recycling workers

Following the sharp increase in global waste generation, heavy metals and metalloids (HMMs) have become a serious threat to workers in the waste recycling industry. However, our understanding of internal exposure levels of HMMs and the relationship between size-resolved particulate matter (PM)-bound HMMs external exposure with internal exposure and oxidative stress among waste recycling workers are limited. Therefore, we collected first morning void urine samples from 20 participants and size-resolved indoor PM_{10} samples at least 45 consecutive days. We then detected 21 urinary HMMs, PM_{10}-bound HMMs and oxidative stress biomarkers (OSBs) of DNA (8-hydroxy-2'-deoxyguanosine [8-OHdG]) and lipids [malondialdehyde (MDA)]. The intraclass correlation coefficients for most HMMs and OSBs ranged from fair to excellent. Linear mixed model analysis showed that urinary HMMs were predominantly affected by warehouse $PM_{1.1\text{-}2.1}$ and $PM_{3.3\text{-}4.7}$ HMM inhalation ($p < 0.05$). Participant 8-OHdG levels were correlated with $PM_{0.43\text{-}10}$ HMM inhalation, particularly in the ranges of $PM_{0.43\text{-}0.65}$, $PM_{4.7\text{-}5.8}$, and $PM_{9.0\text{-}10}$, with every unit increase in the ln-transformed average daily intake (ADI) generating a 4.30-28.0% increase in urinary 8-OHdG ($p < 0.05$). Furthermore, MDA levels were generally correlated with $PM_{0.43\text{-}2.1}$ HMM inhalation ($p < 0.05$), especially in the $PM_{0.43\text{-}0.65}$ range, with each unit increase in the ln-transformed ADI generating a 8.5-24.1% increase in urinary MDA. This study reveals the fair to excellent long-term reproducibility of urinary HMM and OSBs and the association between high-level PM-bound HMM exposure and early health impairment for an actual working environment.

Li et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: Exposure–response analysis; heavy metals and metalloids; interclass correlation coefficient; oxidative stress; particulate matter; reproducibility.
Evidence Level: 3B
Link: https://www.nature.com/articles/s41598-025-09250-1

Occupational exposure to engine exhausts and prostate cancer risk

Background: Some engine exhausts (EEs) have been classified as carcinogens and/or can have hormone-modulating properties that could play a role in prostate cancer development. **Objective:** We investigated associations between lifetime occupational exposure to various EEs and prostate cancer risk, overall and for aggressive cancers. **Methods:** In a population-based case-control study conducted in Montreal, Canada, 1,924 incident histologically confirmed prostate cancer cases (436 aggressive) and 1,989 population controls were recruited. Socio-demographics, lifestyle factors and a detailed occupational history were collected during in-person interviews. Industrial hygienists conducted evaluations of intensity, frequency and reliability of exposure to EEs resulting from the combustion of several fuels (any diesel, light- and heavy-duty diesel, leaded and unleaded gasoline, propane and jet fuel) in each job held ≥ 2 years. Odds ratios (ORs) and 95% confidence intervals (CI) were estimated for exposure to each EE, in association with prostate cancer risk, adjusting for age and then for potential lifestyle and occupational confounders, accounting for a 5-year latency period. As most associations were not linear, we fitted functions for changes in percentile distributions based on natural cubic splines. **Results:** There was no evidence of associations between exposure to the various EEs and overall prostate cancer. However, for high-grade cancers, based on the fully adjusted model, a change from the 25th to the 75th percentile of the exposure distribution of any diesel EE yielded an OR of 1.24 (95%CI 0.96-1.61), and of 1.27 (95% CI 0.80-2.01) for a change from the 75th to the 95th percentile. These increases reflected exposure to diesel EE from light-duty vehicles, associated with similar ORs. For leaded gasoline EE, a change from the 75th to the 95th percentile resulted in an age-adjusted OR of 1.36 (95%CI 0.88-2.11), which was attenuated to 1.12 (95%CI 0.63-2.02) after full adjustment. There were no associations with EE from unleaded gasoline, diesel from heavy-duty vehicles, jet fuel and propane. **Conclusion:** There was suggestive evidence for a deleterious role of occupational exposure to EE resulting from the combustion of any diesel, light-duty diesel and from leaded gasoline in the development of aggressive prostate cancer. Results were independent from prostate cancer screening patterns.
Barul et al. 2025.
Environmental Health, vol. 24, no. 1.

Keywords: Engine exhausts; occupational exposure; prostate cancer; screening.
Evidence Level: 4B
Link: https://ehjournal.biomedcentral.com/articles/10.1186/s12940-025-01205-3

Impact of occupational exposure to wildfire events on systemic inflammatory biomarkers in Portuguese wildland firefighters

While occupational exposure as a firefighter is considered a dangerous occupation, research on the underlying mechanisms remains limited, particularly in wildland firefighters. Inflammation, a key effect of wildfire exposure, plays a significant role in the development of various diseases. The current study aims to investigate the impact of wildland firefighting exposure on the levels of pro-inflammatory systemic biomarkers. A pre-post study design investigated 59 wildland firefighters comparing data collected after participation in a wildfire event (Phase II) with data obtained before wildfire season (Phase I). Data on demographics, lifestyle, health and occupational-related factors were assessed. Exposure factors, such as fire combat (e.g., exposure duration), were also registered. Inflammatory biomarkers (i.e. interleukin-6 [IL-6], interleukin-8 [IL-8], tumour necrosis factor α [TNF-α] and high-sensitivity C-reactive protein [hs-CRP]) and hydroxylated polycyclic aromatic hydrocarbons metabolites (1-OHNaph+1-OHAce, 2-OHFlu, 1-OHPhen, 1-OHPyr) were analysed in blood and urine samples, respectively. Serum IL-8 and IL-6 levels were

significantly increased after wildland fire combat. IL-8 levels were 2.62 times higher (95 % CI: 1.96-3.50; p < 0.01), whereas IL-6 levels were 1.25 times higher (95 % CI: 1.00-1.57; p = 0.04). Furthermore, IL-8 levels were significantly correlated with urinary 2-hydroxyfluorene levels and fire combat duration (>12 h). In addition, the mean hs-CRP level, in both phases, was above 3.0 mg/L, indicating a potential risk for cardiovascular events. Given the long-term health implications of firefighting occupational exposure, biomonitoring and early detection of occupational risks are essential for protecting firefighters' health. Protective measures must be urgently implemented to enhance occupational health and strengthen preventive strategies in this sector.

Esteves et al. 2025.

Environmental Research, vol. 277.

Keywords: Biomarkers; cytokines; firefighting; inflammation; wildland firefighters; woodsmoke exposure.

Evidence Level: 4B

Link: https://www.sciencedirect.com/science/article/pii/S001393512500859X?via%3Dihub

Health effects of low-dose formaldehyde exposure: A cross-sectional study in occupational settings

Objectives: To evaluate the health effects of low-dose formaldehyde exposure in occupational settings, focusing on dermatological and respiratory symptoms and the influence of work tenure. **Material and methods:** A cross-sectional study was conducted on 414 workers undergoing annual health check-ups at a medical centre in Taiwan with 242 individuals categorized as exposed (high exposure [N = 57], low exposure [N = 185]) and 172 as controls. Formaldehyde exposure was assessed through environmental monitoring, with all exposure levels <10% of the permissible exposure limits. Self-reported clinical symptoms, complete blood count (CBC) parameters, and pulmonary function were assessed. Logistic regression analysis was performed to assess exposure-related health effects, adjusting for potential confounders. Tenure was analysed as both a continuous and categorical variable to assess its impact on health outcomes. **Results:** The exposure group reported significantly higher rates of irritation related symptoms (9.5% vs. 0.6%, p = 0.009) and skin symptoms (1.7% vs. 0%, p < 0.001) compared to controls. After adjusting for confounders, allergic rhinitis (OR = 16.78, 95% CI: 4.00-70.55, p < 0.001) and allergic dermatitis (OR = 18.83, 95% CI: 2.52-140.56, p = 0.004) remained significantly associated with formaldehyde exposure. No significant differences were found in CBC parameters or pulmonary function between groups. **Conclusions:** Even at low exposure levels, formaldehyde was associated with an increased risk of allergic conditions and irritation-related symptoms. While pulmonary function remained unchanged, the higher prevalence of allergic rhinitis and dermatitis suggests potential immune sensitization. These findings emphasize the importance of workplace exposure monitoring and preventive measures. Future longitudinal studies incorporating biomarkers are needed to clarify causal relationships and refine occupational health policies.

Fan et al. 2025.

International Journal of Occupational Medicine and Environmental Health, vol. 38, no. 3.

Keywords: Cross-sectional studies; dermatologic diseases; formaldehyde; occupational exposure; respiratory tract diseases; workplace.

Evidence Level: 4B

Link: https://ijomeh.eu/Health-effects-of-low-dose-formaldehyde-exposure-a-cross-sectional-study-in-occupational,203291,0,2.html

Effects of air pollution and noise exposure on occupational hearing loss in oil workers: A prospective cohort study

Background: Occupational Hearing Loss (OHL) is a significant health concern among oil workers, influenced by environmental and occupational factors. This study investigates the independent and synergistic effects of air pollution and noise exposure on OHL risk in this high-risk population. **Methods:** A prospective cohort study included 1,179 oil workers from Hebei Province, China, with baseline data (2017-2019) and follow-up

until 2023. Air pollution exposure ($PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and the Air Quality Comprehensive Index, AQCI) was assessed using monitoring station data, while cumulative noise exposure (dB(A)-year) was calculated from workplace measurements. Multivariable-adjusted Modified Poisson regression and Restricted Cubic Splines (RCS) analysed associations and dose-response relationships. **Results:** The OHL incidence was 34.5% (n = 407). Air pollutants exhibited significant nonlinear associations with OHL: $PM_{2.5}$ showed a U-shaped curve, SO_2 an inverted U-shape, and NO_2 an S-shaped curve. Noise exposure ≥ 85 dB(A)-year tripled OHL risk (Relative Risk, RR = 2.361, Confidence Interval, 95%CI: 1.861-2.994). Synergistic effects were robust for AQCI (RR = 5.776, 95%CI:3.225-10.345) and NO_2 (RR = 4.297, 95%CI:1.879-9.825) with high noise exposure, while PM_{10} demonstrated antagonistic effects. **Conclusions:** Air pollution and noise exposure independently and synergistically increase OHL risk in oil workers. AQCI and NO_2, combined with noise, are critical risk factors. These findings underscore the need for integrated exposure monitoring, optimized ventilation, and enhanced personal protective measures in high-risk occupational settings.

Li et al. 2025.

BMC Public Health, vol. 25, no. 1.

Keywords: Air pollution; noise exposure; occupational hearing loss; oil workers; risk assessment; synergistic effects.

Evidence Level: 4B

Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23677-1

Blockchain-secured IoT-federated learning for industrial air pollution monitoring: A mechanistic approach to exposure prediction and environmental safety

Air pollution in industrial zones significantly impacts environmental safety and worker health. This paper presents a novel decentralized IoT-federated learning (FL) framework, uniquely integrated with blockchain security, designed to provide a mechanistic understanding and accurate predictive modelling of air pollutant exposure in industrial environments. The novelty lies in the integration of a hybrid EMD-Transformer-BiLSTM prediction model with a blockchain-backed federated learning mechanism, providing secure, tamper-proof decentralized model updates. Three IoT-based sensing units, deployed across an industrial facility for five months, continuously monitored pollutants (PM2.5, PM10, CO_2, VOCs, CH_2O, CO, and O_3) and environmental factors (temperature, humidity). The innovative model improved prediction accuracy from 83.12 % to 92.5 % for short-term (5-minute) forecasts, stabilizing at 84.7 % for 60-minute predictions after 15 FL rounds. Model validation indicated strong predictive reliability (R^2 = 0.89), significantly reducing prediction errors (Mean Absolute Error and Root Mean Square Error). Blockchain integration successfully ensured data integrity, identifying and rejecting over 98.7 % of unauthorized updates. Additionally, a swarm intelligence approach optimized decentralized model aggregation, minimizing communication overhead despite increased security latency (FL rounds increased from 7.5 s to 13.5 s for 500 clients). Real-time RGB-based air quality index visualization and cloud-based spatio-temporal mapping provided actionable insights into pollutant dynamics. This study demonstrates a distinct advancement in air pollution monitoring by combining federated learning, blockchain technology, and real-time adaptive visualization for enhanced environmental safety in industrial settings.

Ramadan et al. 2025.

Ecotoxicology and Environmental Safety, vol. 300.

Keywords: Air quality prediction; blockchain security; federated learning; IoT-driven monitoring; spatio-temporal mapping.

Evidence Level: 6B

Link: https://www.sciencedirect.com/science/article/pii/S0147651325007821?via%3Dihub

Assessment of individual exposure to multiple pollutants (noise, particulate matter, and extremely low-frequency magnetic fields) related to daily life microenvironments in the brussels capital region: Protocol for a cross-sectional study

Background: Environmental factors are responsible for 13% of annual deaths in Europe. Citizens are constantly exposed to a variety of environmental factors, such as noise, air pollutants, and magnetic fields (MFs), which may interact with one another. To study multiple-pollutant exposures simultaneously, data on individual citizens, collected using portable measuring devices, provide a high level of detail for exposure characterization. **Objective:** The aims of this study are to (1) assess the exposure of urban citizens to multiple pollutants (noise, particulate matter [PM], and extremely low-frequency magnetic fields [ELF-MFs]) on a normal weekday, (2) estimate the contribution of each main daily life microenvironment in the multiple-pollutant exposure, and (3) estimate the role of measured exposure in the assessment of perceived personal exposure. **Methods:** We collected the exposure levels of 490 individuals to multiple pollutants: PM, ELF-MFs, and noise levels. We used 3 devices per participant (Airbeam 2, EMDEX II or EMDEX Lite, and a smartphone with the Aircasting app for PM, ELF-MFs, and noise, respectively). Participants wore them for 24 hours on a normal weekday. In parallel, they filled out a microenvironment diary and a questionnaire focusing on socioeconomic data, lifestyle, and perceived exposures. The analysis will first describe the exposures as daily averages and aggregated by microenvironment. Several analyses will be conducted: (1) an estimation of the contribution of each microenvironment in the exposure levels of the 3 pollutants studied, (2) a linear mixed model (for each pollutant) to explain the measured levels of exposure, and (3) linear regression to assess the contribution of the measured personal exposure in self-reported perceived exposures. **Results:** Data collection was carried out from October 2020 to August 2022, with 490 individuals taking part. The databases have been gathered and cleaned. Future work will focus on data analysis. **Conclusions:** The collected data will allow us to describe the daily multiple-pollutant exposures faced by individuals within the general population and to characterize the main microenvironments of their daily lives according to multiple-pollutant exposures. This will help identify precise microenvironments to be targeted in policies aiming to reduce exposure to pollution. Because the sampling method is not probabilistic, it is not expected to be representative of the population of the Brussels Capital Region, but it will provide a first step in the understanding of multiple-pollutant exposures faced by individual citizens.

International registered report identifier (irrid): DERR1-10.2196/69407.
Salmon et al. 2025.
JMIR Research Protocols, vol. 14.

Keywords: ELF-MF; PM; extremely low-frequency magnetic fields; microenvironment; multiple exposures; noise; particulate matter; personal exposure; pollutants.
Evidence Level: 6B
Link: https://www.researchprotocols.org/2025/1/e69407

Occupational carbon footprints and exposure to climate transition risks

Workers, especially those involved in occupations with high carbon footprints, are more susceptible to the growing risks associated with the climate transition as a result of the urgent need to transition to a low-carbon economy. Here we trace the occupational carbon footprints along global value chains and estimate the associated exposure to climate transition risks. The volume of occupational carbon footprints is trending upward globally, with the expansion of primary labour inputs as the main driving factor. There is a considerable deal of territorial and occupational variance in carbon footprints from the perspectives of both volume and per worker. The most vulnerable to climate transition risks are drivers, craft workers and machine operators, particularly those operating in emerging countries. The current study's findings may help the understanding of the role that workers play in climate change and the formulation of more targeted policies to protect vulnerable workers.

Zhang et al. 2025.
Nature Communications, vol. 16, no. 1.

Keywords: Carbon footprints; climate transition; risk; high carbon.
Evidence Level: 6B
Link: https://www.nature.com/articles/s41467-025-61011-w

Sedentary Practices

Effectiveness of short active breaks for reducing sedentary behaviour and increasing physical activity among Japanese office workers: One-year quasi-experimental study

Objectives: We examined the effects of a one-year multicomponent workplace intervention that introduced short active breaks from prolonged sitting on occupational movement behaviours and health among Japanese office workers. **Methods:** This quasi-experimental study was conducted in Tokyo, Japan (2019-2020). In the intervention group (N=172), activity breaks from sitting were introduced to the work schedule (approximately 10 minutes/working hour) together with support strategies to encourage participation (eg, social support, provision of information). Workers in the control group (N=323), who worked at the same company group as those in the intervention group, did not receive any intervention. We evaluated accelerometer-measured sedentary behaviour and physical activity during working hours as primary outcomes, and mental health and subjective job performance as secondary outcomes. Propensity score weighting using overlap weights was performed to examine between-group differences in outcomes at one year. **Results:** At the one-year follow-up assessment, sedentary behaviours during working hours in the intervention group decreased by 24.4 minutes (95% confidence interval 31.6-17.3), with physical activity increasing by a comparable amount (P for group difference <0.05). However, at the one-year follow-up, psychological distress had worsened, and work engagement had declined in the intervention group relative to baseline (P for group difference <0.05). **Conclusions:** Our findings suggest that this program is a feasible approach to reducing sedentary behaviour and promoting physical activity during work hours among office workers. However, methodological limitations prevent the definitive attribution of the effects to the intervention. Further rigorous research is needed to assess its effectiveness and external validity before broad implementation.
Kitano et al. 2025.
Scandinavian Journal of Work, Environment and Health, vol. 51, no. 4.

Keywords: Sedentary behavior; active breaks; physical activity; office workers.
Evidence Level: 3B
Link: https://www.sjweh.fi/article/4224

Does accelerometer-measured physical activity and sedentary time differ between manual, in-office, hybrid and remote workers?

Objectives: Studies on accelerometer-measured daily physical activity behaviour, especially among hybrid and remote workers, are scarce. We compared daily occupational and non-occupational physical activity and sedentary time among manual, in-office, hybrid and remote workers. In addition, physical activity behaviour during remote and office workdays among hybrid workers was compared. **Methods:** Daily physical activity behaviour was collected with wrist-worn accelerometers on ≥4 days from 133 Finnish workers (31 years, 61% women). Participants were divided into four groups according to their work modes: manual (n=32), in-office (n=49), hybrid (n=35) and remote workers (n=17). Differences in physical activity and sedentary time during workdays (separately for occupational and non-occupational time) between the groups were examined using generalised linear models. Linear mixed models were used for intra-individual differences among hybrid workers. **Results:** Workdays' occupational physical activity and sedentary time differed between the work mode groups (p<0.0001); the manual workers accumulated the highest occupational physical activity, while both hybrid and remote workers accumulated the highest occupational sedentary time. No differences in non-occupational behaviours were observed. Among hybrid workers, occupational sedentary time tended to be higher (26 min, 95% CI -2 to 53) during remote versus office workdays, but non-occupational behaviours were similar. **Conclusions:** Remote work is associated with the lowest physical activity and the highest sedentary time compared with other work modes. Strategies to promote physical activity during remote workdays may be needed.

Leskinen et al. 2025.
Occupational and Environmental Medicine, vol. 82, no. 5.

Keywords: Epidemiology; physical activity; public health; workers.
Evidence Level: 4B
Link: https://oem.bmj.com/content/82/5/238.long

Comparison of sedentary time, number of steps and sit-to-stand-transitions of desk-based workers in different office environments including working from home: Analysis of quantitative accelerometer data from the cross-sectional part of the SITFLEX Study

Objectives: Sedentary behaviour is associated with diseases (eg, cardiovascular, diabetes type 2). We aimed to describe the sitting and moving behaviour of desk-based hybrid employees of a large company in Germany working in either a traditional open plan office (OPO) or an activity-based flex office (AFO) and when working from home. We also aimed to determine if the behaviours differ between both working environments (ie, working from home versus the office) and the office concepts (OPO versus AFO). **Methods:** We conducted a cross-sectional study to measure sedentary time, sit-to-stand-transitions (STS), standing, and physical activity (time spent physically active and steps) in different working environments with activPAL3. Time-use data were also examined using compositional data analysis. Mixed model regression was performed to estimate means and 95% confidence intervals (CI). The main models were adjusted for sex, age, profession and measurement phase (July-November 2021). **Results:** The sample comprised 102 employees (women: N=27, mean age 38.9 years). On average, OPO employees spent 351 minutes (95% CI 322-380) being sedentary, took 2763 steps (95% CI 2460-3066) and made 16.6 STS (95% CI 13.6-19.6). AFO workers averaged 333 sedentary minutes (95% CI 308-358), 2906 steps (95% CI 2645-3167) and 19.1 STS (95% CI 16.6-21.7). When working from home, workers spent 378 minutes (95% CI 359-396) being sedentary, took 1257 steps (95% CI 1063-1452) and made 20.9 STS (95% CI 19.0-22.8). Working from home was associated with increased sedentary time and fewer steps but more STS. **Conclusion:** Sedentary time of desk-based workers seems to be prolonged when working from home. As sedentary behaviour increases the risk of disease, there is a need for measures to reduce employees` sedentary time in all working environments.
Sauter et al. 2025.
Scandinavian Journal of Work, Environment and Health, vol. 51, no. 4.

Keywords: Sedentary; sit-to-stand; desk-based; office workers; working from home.
Evidence Level: 4B
Link: https://www.sjweh.fi/article/4228

Factors influencing reducing sedentary time in home office employees

Evidence suggests that working from home increases the sedentary behaviours of desk-based workers, which may have deleterious health consequences. Owing to the unique nature of working from home, it is important to understand employees' perspectives on the factors influencing their ability to reduce their sedentary behaviours. This qualitative study employed semi-structured focus groups and interviews with desk-based employees to investigate perspectives on the factors influencing their ability to reduce their sedentary behaviours in a home-office context. Reflexive thematic analysis was used to analyse the data. Employees want the autonomy to choose when and how they reduce their sedentary behaviours. They want organisations to support them and incorporate a social element into interventions. Employees do not feel trusted whilst working from home, which creates a reluctancy to leave their desk. There is a need for education on the negative health outcomes associated with high levels of sedentary behaviours, while employees want to be held accountable for changing their behaviour and for their efforts in reducing their sedentary behaviours to be rewarded. These results highlight the need for multi-component interventions to reduce sitting in the home-office context. Organisations should provide employees autonomy over how they reduce their siting time and work to reduce the stigma of working from home. Interventions must also educate staff on the health consequences associated with higher levels of sedentary time.
Coffey et al. 2025.

Scientific Reports, vol. 15, no. 1.

Keywords: Health; home-office; physical activity; sedentary behaviour.
Evidence Level: 5A
Link: https://www.nature.com/articles/s41598-025-08831-4

Physical Activity

High occupational physical activity and its combined effect with leisure-time physical activity on cardiovascular disease and mortality: Systematic reviews and meta-analyses

The objective of our systematic reviews and meta-analyses were to analyse the associations between high occupational physical activity (HOPA) and cardiovascular (CV) disease (CVD) and CV mortality and the role of leisure-time physical activity (LTPA) and fitness capacity on these associations. Two systematic reviews and related meta-analyses were undertaken using several databases to identify prospective cohort studies. Random-effect models were used to provide ORs and 95% CI, index I^2 to characterise the associations between the effect of exposure to HOPA on CVD and CV mortality in adjusted and unadjusted models. Stratified analyses according to the level of LTPA were provided. The Newcastle-Ottawa Scale was used to assess the quality of studies. From 25 and 28 prospective studies: compared with workers exposed to low OPA, HOPA increased the risk of CVD non-significantly (+12%), while compared with moderate OPA, a significant excess of risk was found (+24%); HOPA did not significantly increase the risk of CV mortality compared with low and moderate OPA groups. Stratified on the practice of high, moderate and low LTPA, the risks of CVD for the HOPA were ORs: 1.27 (0.86 to 1.88), 1.08 (0.61 to 1.92), 1.28 (1.00 to 1.62) versus low OPA group, respectively. A combination of low physical fitness and high OPA seemed to expose individuals to an elevated risk of CVD. Being exposed to HOPA may have the same effect on CVD as being exposed to low OPA and an excess risk compared with moderate OPA exposure, suggesting a curve effect. The combined effects of leisure and OPA must be considered in future research.
Fernandez et al. 2025.
Occupational and Environmental Medicine, vol. 82, no. 4.

Keywords: Cardiology; occupational health; physical activity; workload.
Evidence Level: 1A
Link: https://oem.bmj.com/content/82/4/199.long

Prospective associations between occupational physical activity level and sleep disturbances: A five-year follow-up study

Background: Sleep disturbances are commonly reported in working populations. While research has identified various work-related risk factors for poor sleep, the relationship between prior occupational physical activity (OPA) and future sleep disturbances remains unclear. The study aimed to examine the prospective associations between OPA levels and sleep disturbances in adults. **Methods:** We utilized longitudinal data from the MJ cohort study (1998 to 2022). The sample (N = 62528) consisted of adults aged 18 years or above. The mean age (in years) was 35.9 (SD = 9.5), and they were working full-time and reported no sleep disturbances at baseline. We examined the prospective associations between self-reported OPA levels (light, moderate, moderately heavy, and heavy) at baseline, and the presence of sleep disturbances at a mean follow-up time of 5.6 years (SD = 4.5). Cox proportional hazard models were conducted, adjusting for potential confounding variables. **Results:** Using light OPA level as the reference group, individuals with moderately heavy OPA (HR: 1.13, 95% CI: 1.07, 1.19, $p < 0.001$) and heavy OPA (HR: 1.22, 95% CI: 1.11, 1.34, $p < 0.001$) at baseline had a higher risk of sleep disturbances at follow-up. Stratified analyses showed that the association between higher levels of OPA and sleep disturbances remained across different subgroups. Notably, these associations were more pronounced among females ($p_{interaction} = 0.008$), for moderately heavy OPA (HR: 1.23, 95% CI: 1.12, 1.35, $p < 0.001$) and heavy OPA (HR: 1.45, 95% CI: 1.10, 1.91, $p = 0.009$). These associations were also more pronounced in certain occupational groups ($p_{interaction} = 0.003$), where only heavy OPA was significantly associated with an elevated risk of sleep

disturbances among civil servants (HR: 1.66, 95% CI: 1.08, 2.55, p = 0.020) and office workers, professionals and technicians (HR: 1.49, 95% CI: 1.09, 2.05, p = 0.010). **Conclusions:** Higher OPA levels were associated with an increased risk of sleep disturbances. Workplace support or interventions are in need to improve sleep patterns.
Wang et al. 2025.
BMC Public Health, vol. 25, no. 1.

Keywords: Insomnia; sleep quality; work characteristics; work demands; working population.
Evidence Level: 4B
Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23684-2

Prospective associations between 24-h device-measured occupational and leisure-time physical activity and register-based musculoskeletal-related primary healthcare utilization among Danish workers

Musculoskeletal pain is a leading cause of seeking care and imposes an immense economic burden to the healthcare systems. The guidelines recommend physical activity for managing musculoskeletal pain but do not differentiate between occupational and leisure-time physical activity. Research indicates that occupational physical activity may not have similar health benefits as leisure-time physical activity. Thus, we investigated the association between occupational and leisure-time physical activity and musculoskeletal-related primary healthcare utilization. At baseline, physical activity data (sitting, standing, light physical activity, moderate-to-vigorous physical activity and time in bed) were collected from 824 blue-collar workers using a thigh-worn accelerometer during work and leisure for up to five days. Musculoskeletal-related primary healthcare utilization (i.e., contacts with general practitioners, physiotherapists and specialists) was retrieved from the Danish National Health Services Registry during a 4-year follow-up from baseline. The association between occupational and leisure-time physical activity and musculoskeletal-related primary healthcare utilization was analysed using a generalized linear model adjusted for potential confounders. During follow-up, 62%, 42% and 10% of the workers had at least one musculoskeletal-related contact to the general practitioner, physiotherapist and specialist, respectively. Leisure-time moderate-to-vigorous physical activity was associated with a decreased risk of a general practitioner contact (RR = 0.78; p value = 0.02), a tendency for a decreased risk of a physiotherapist contact (RR = 0.83; p value = 0.23), but with a tendency for increased risk of a specialist contact (RR = 1.49; p value = 0.20). On the contrary, occupational moderate-to-vigorous physical activity was not associated with a decreased risk of a general practitioner contact (RR = 1.04; p value = 0.75), physiotherapist contact (RR = 1.00; p value = 0.99) or a specialist contact (RR = 1.80; p value = 0.05). Our findings indicate that the domain of physical activity is of importance for musculoskeletal-related primary healthcare utilization. While leisure-time physical activity was associated with a decreased risk of a general practitioner and physiotherapist contact, occupational physical activity was not associated with such benefits.
Kyriakidis et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: Accelerometers; blue-collar workers; leisure-time; musculoskeletal; occupational; physical activity; primary healthcare utilization; register-based.
Evidence Level: 4B
Link: https://www.nature.com/articles/s41598-025-09469-y

Musculoskeletal Health

Factors and their age differences associated with low back pain among Japanese workers: A cross-sectional study

This study aimed to examine the factors, and their age differences associated with low back pain (LBP), including lifestyle and psychosocial factors, among Japanese workers at a large company. The study population consisted of 25,610 workers (mean ± SD age, 44.7 ± 9.6 yr) who underwent annual health

checkups and completed the Brief Job Stress Questionnaire (BJSQ) at a Japanese company in 2017. The self-administered questionnaire was used to assess gender, age, occupation, smoking status, exercise status, alcohol intake, job stress, and sleep duration. LBP presence was assessed using a part of the BJSQ. Multivariable-adjusted logistic regression analyses were performed to examine the factors associated with LBP according to age category. The prevalence of LBP in the study group was 23.3%. After stratification by age, overweight status and job stress were found to be significantly associated with LBP in all age groups. However, smoking status was significantly associated with LBP among individuals aged <40 yr (effect of interaction p=0.03) whereas exercise was significantly associated only among individuals aged ≥40 yr (effect of interaction p<0.01). This study shows that LBP factors may differ by age, highlighting the importance of age-appropriate measures for preventing LBP in workers.

Sato et al. 2025.

Industrial Health, vol. 63, no. 4.

Keywords: Age; cross-sectional study; Japanese workers; life style; low back pain; psychosocial factors.

Evidence Level: 4B

Link: https://www.jstage.jst.go.jp/article/indhealth/63/4/63_2024-0067/_article

Vitamin D status and its association with muscle discomfort among Malay female indoor workers: A cross-sectional study

Vitamin D is important for musculoskeletal health, yet deficiencies remain prevalent among individuals with limited sun exposure. This study assessed serum 25-hydroxyvitamin D (25(OH)D) levels and their association with muscle discomfort in Malay female indoor workers. A total of 100 participants (aged 18-55 years) were recruited. Data on dietary vitamin D intake, sun-protective behaviours and muscle discomfort were collected using questionnaires. UVB exposure was assessed with polysulfone badges, and skin colour was measured with a reflectance spectrophotometer. Serum 25(OH)D levels were analysed via enzyme-linked immunoassay, with deficiency defined as < 30 nmol/L and insufficiency as ≥ 30-50 nmol/L. The median serum 25(OH)D level was 29.0 nmol/L (IQR: 10.0), with 54% classified as deficient and 36% as insufficient. Most participants (85%) had skin type II, and 93% did not meet dietary vitamin D recommendations. Limited UVB exposure (0.07 ± 0.06 SED/d) was recorded, with most participants exposing only their faces and hands. Muscle discomfort was commonly reported, particularly in the neck (90%), shoulders (88%) and lower back (79%). Serum 25(OH)D levels correlated negatively with muscle discomfort ($r = -0.20$; $p = 0.04$) and positively with dietary intake ($r = 0.43$, $p < 0.001$) and physical activity ($r = 0.45$, $p < 0.001$). Linear regression identified dietary vitamin D intake ($\beta = 0.59$, $p < 0.001$) and physical activity ($\beta = 0.25$, $p = 0.002$) as significant predictors of serum 25(OH)D levels. Multifaceted public health strategies addressing dietary supplementation, food fortification, safe sun exposure and physical activity are essential to improve vitamin D status and musculoskeletal health in this population.

Md Salleh et al. 2025.

Scientific Reports, vol. 15, no. 1.

Keywords: 25-hydroxyvitamin D; indoor workers; Myalgia; sunlight; women.

Evidence Level: 4B

Link: https://www.nature.com/articles/s41598-025-10424-0

The leisure time and occupational physical activity paradox in persistent musculoskeletal pain

Leisure time and occupational physical activity (LTPA, OPA) seem to have opposite associations with some health outcomes. Few studies have investigated this for musculoskeletal pain. We investigated the association between (1) LTPA and OPA, and (2) combinations thereof, and persistent pain and number of pain sites, respectively, among adults. We used cross-sectional data from the Copenhagen City Heart Study. LTPA and OPA was measured using the Saltin-Grimby Physical Activity Level Scale. The outcomes were persistent pain and number of pain sites (past six months). Using hurdle models, the association between physical activity and the outcomes was expressed as odds ratios (OR) and incidence rate ratios. We included 2787 individuals. High LTPA was associated with decreased odds of persistent pain and lower

number of pain sites, whereas high OPA was associated with increased odds of persistent pain and higher number of pain sites (e.g., high LTPA vs. inactive, OR: 0.38, 95% confidence interval [CI]: 0.26, 0.57; high OPA vs. sedentary work, OR: 2.94, 95% CI 1.66, 5.20). All LTPA-OPA-combinations indicated higher odds for persistent pain and higher number of pain sites when compared to moderate-to-high LTPA and sedentary work. This study highlights that not all physical activity may be beneficial.
Johansson et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: Leisure-time physical activity; occupational physical activity; physical activity health paradox; musculoskeletal pain.
Evidence Level: 5B
Link: https://www.nature.com/articles/s41598-025-05815-2

Guiding and Supporting Mental Health and Wellbeing

Mental Health

The prevalence of common mental disorders, stress, and sleep disturbance among international migrant workers: A meta-analysis with subgroup analysis

International migrant workers face an elevated risk of common mental disorders (CMDs), stress, and sleep disturbances due to various individual, psychosocial, and occupational factors. This meta-analysis systematically evaluated the prevalence of CMDs, stress, and sleep disturbance among international migrant workers. Two independent reviewers systematically searched the literature on five electronic databases from inception to June 2022. Random effects meta-analyses were performed to estimate the pooled prevalence of depressive symptoms, anxiety symptoms, stress, and sleep disturbance among international migrant workers. Additionally, subgroup analyses were conducted to examine potential modifiers for the prevalence rates. Of 8461 records, 57 studies (n = 29,481) were included in this meta-analysis. The pooled prevalence rates of depressive symptoms, anxiety symptoms, stress, and sleep disturbance were 20.3 %, 17.8 %, 17.3 %, and 25.3 %, respectively. Subgroup analyses revealed that the prevalence of CMDs and stress was statistically significantly modified by country of destination and type of work, stress by gender and country of origin, and anxiety by migration type. Potential publication bias was observed only in the meta-analysis of stress. Most of the studies included were of moderate to high methodological quality. However, given that the included studies were predominantly cross-sectional and used non-probability sampling, the results should be interpreted with caution. This meta-analysis highlights that CMDs, stress, and sleep disturbances are prevalent among international migrant workers, posing a significant public health concern for host countries. These findings underscore the urgent need for tailored mental health interventions for specific subgroups within this population.
Yema et al. 2025.
Journal of Affective Disorders, vol. 381.

Keywords: Anxiety; depression; migrant workers; prevalence; sleep; stress.
Evidence Level: 1A
Link: https://linkinghub.elsevier.com/retrieve/pii/S0165-0327(25)00532-4

Burnout among primary care practitioners and staff in VA clinics using virtual contingency staffing

Importance: Primary care practitioners (PCPs) and staff in Veterans Health Administration (VHA) clinics with staffing shortages have reported higher rates of burnout that may be associated with higher workloads. Introducing PCPs through the Clinical Research Hub (CRH) virtual contingency staffing program into these clinics may help reduce burnout but may also disrupt workflows and increase burnout.

Objective: To understand how rates of burnout among VHA PCPs and staff vary by staffing level and CRH program use. **Design, setting, and participants:** This survey study used annual, repeated, cross-sectional VHA employee survey data from fiscal years 2018 to 2022 to examine associations between staffing and burnout before and after implementation of the CRH program. **Exposure:** Clinical Research Hub virtual contingency PCP visits. **Main outcome and measures:** The main outcome was burnout as measured using multilevel, mixed-effects logistic regression to estimate the association between health care system-level PCP staffing and individual-level PCP and staff burnout before and after implementation of the CRH program. An interaction term was used to test the association between program use and burnout in health care systems with full and less-than-full PCP staffing, controlling for PCP, staff, and health care system characteristics. Estimated marginal means of burnout were calculated from model results. **Results:** Survey responses from 134 640 PCPs and staff (53% younger than 49 years; 70% female) in 139 VHA health care systems were analysed. From fiscal years 2018 to 2022, 38% of PCPs and staff experienced burnout, and CRH visits ranged from a median of 0 to 127.6 (IQR, 76.7-237.4) visits per 1000 patients at the health care system level. In estimations derived from the full model, the probability of burnout was higher in clinics without full PCP staffing before program implementation (34.3% [95% CI, 33.4%-35.2%] without full staffing vs 36.5% [95% CI, 35.3%-37.8%] with full staffing) and in the lowest tertile of CRH visits (37.4% [95% CI, 36.4%-38.4%] without full staffing vs 40.2% [95% CI, 38.3%-42.1%] with full staffing). However, burnout did not differ by staffing at higher levels of CRH visits. **Conclusions and relevance:** In this survey study of VHA PCPs and staff, the association between low staffing and burnout was mitigated at higher levels of CRH program use, suggesting that contingency PCPs may alleviate high workload in short-staffed clinics.
Apaydin et al. 2025.
JAMA Network Open, vol. 8, no. 7.

Keywords: Primary care practitioners; burnout; contingency staffing.
Evidence Level: 4B
Link: https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2836018

Changes in burnout and satisfaction with work-life integration in physicians and the general US working population between 2011 and 2023

Objective: To evaluate the prevalence of burnout and satisfaction with work-life integration (WLI) among physicians and US workers in 2023 relative to 2011, 2014, 2017, and 2020, as well as physicians in 2021. **Participants and methods:** Between October 19, 2023, and March 3rd, 2024, we surveyed US physicians and a probability-based sample of the US working population using methods similar to previous studies. Burnout and WLI were measured using standard tools. **Results:** Demographic characteristics of the 7643 survey participants were similar to those of practicing US physicians (N=936,074), although participants were more likely to be women (39.6% vs 37.9%). Non responder analysis suggested participants were representative of US physicians with regard to burnout and satisfaction with WLI. Overall, 45.2% of physicians reported at least 1 symptom of burnout in 2023 compared with 62.8% in 2021 (P<.001), 38.2% in 2020 (P<.001), 43.9% in 2017 (P=.16), 54.4% in 2014 (P≤.001), and 45.5% in 2011 (P=.49). Overall, 42.2% of physicians (n=2732) were satisfied with WLI in 2023, compared with 30.3% in 2021 (P<.001), 46.1% in 2020 (P<.001), 42.8% in 2017 (P=.02), 40.9% in 2014 (P<.001), and 48.5% in 2011 (P <.001). On multivariable analysis of 2023 participants, physicians were at increased risk for burnout (odds ratio=1.82; 95% CI, 1.63 to 2.05) and were less likely to be satisfied with WLI (odds ratio=0.59; 95% CI, 0.53 to 0.66) than other US workers. **Conclusion:** Burnout among US physicians improved between 2021 and 2023 and is currently at levels similar to 2017. However, US physicians remain at higher risk for burnout relative to other US workers.
Shanafelt et al. 2025.
Mayo Clinic Proceedings, vol. 100, no. 7.

Keywords: Burnout; satisfaction; work-life; physicians.
Evidence Level: 4B

Link: https://www.mayoclinicproceedings.org/article/S0025-6196(24)00668-2/fulltext

The effect of post-military reform on vicarious traumatization and work stress in firefighters: The mediating role of work alienation

Based on conservation of resources (COR) theory, this study explored the relationships between vicarious traumatization, work alienation, and work stress in firefighters. The vicarious traumatization questionnaire, the work alienation questionnaire, and the work stress questionnaire were used to survey 397 in-service firefighters. The results showed that (1) firefighters' vicarious traumatization significantly and positively predicted their work stress and (2) firefighters' work alienation mediated that relationship. This study not only enriches the literature on firefighters' occupational mental health, but also provides theoretical support for China's firefighting teams to reduce their work stress and ensure team stability in the context of China's current efforts toward military-to-civilian professionalization reform.

Cai et al. 2025.

Scientific Reports, vol. 15, no. 1.

Keywords: Firefighters; vicarious traumatization; work alienation; work stress.

Evidence Level: 5B

Link: https://www.nature.com/articles/s41598-025-12664-6

Adapting the group traumatic episode protocol approach as a paraprofessional-led early intervention for law enforcement personnel

Background: Law enforcement personnel experience high levels of occupational stress and frequent exposure to potentially traumatic events, requiring effective early interventions. The Modified Group Traumatic Episode Protocol (mGTEP) is an adaptation of Eye Movement Desensitization and Reprocessing (EMDR) designed to help individuals process traumatic experiences in a group setting. This study evaluated the feasibility and effectiveness of a paraprofessional-led mGTEP within the law enforcement population.

Methods: Police officers and staff, with peer support background, were trained as paraprofessionals to facilitate mGTEP as early mental health support for their colleagues. Their role bridges the gap between informal peer support and professional mental health services. Psychological distress (single-item scale), depression (PHQ-9), anxiety (GAD-7), and trauma-related stress (PCL-5) were assessed at baseline (T1), post-intervention (T2), and follow-up (T3). Multilevel statistical analyses were conducted to evaluate changes over time. A sample of 40 law enforcement personnel participated in online mGTEP sessions. The sample consisted of mostly males (54 %), ranging from age 28 to 53 with an average of 14 years working in the police. Multilevel modelling was applied to the repeated measures design to analyse changes across three time points, combining both random (e.g., participant) and fixed (e.g., time) effects.

Results: Significant reductions were observed from T1 to T2 in distress (d = 0.69, large), anxiety (d = 0.65, large), and trauma-related stress (d = 0.48, medium), with sustained improvements in depression (d = 0.26, small) and trauma-related stress (d = 0.48, medium) at follow-up. Anxiety scores slightly increased between T2 and T3 (d = 0.36, small). Similarly, distress scores did not continue to decline beyond T2. These results potentially reflect the ongoing demands of policing and continued exposure to trauma.

Conclusion: This study highlights the feasibility of mGTEP as a paraprofessional-led early intervention for law enforcement personnel, demonstrating significant symptom reductions. While improvements in depression and trauma-related stress persisted, fluctuations in anxiety and distress levels suggest the need for continued support post-intervention. Given the cumulative nature of occupational stress in policing, regular implementation may be necessary to sustain benefits. Integrating mGTEP into existing mental health programs could enhance accessibility, allowing it to complement other psychological support initiatives.

Ozga et al. 2025.

Comprehensive Psychiatry, vol. 140.

Keywords: EMDR; early intervention; first responders; GTEP; law enforcement; mental health; police.

Evidence Level: 5B

Link: https://www.sciencedirect.com/science/article/pii/S0010440X25000239?via%3Dihub

Bullying, Harassment and Occupational Violence

Workplace bullying and turnover intentions among workers: A systematic review and meta-analysis

Background: Workplace bullying occurs in various professions worldwide and significantly impacts employees and organizations. Researchers have reported that workplace bullying may be associated with an increased intention to leave one's job. However, the conclusions regarding this relationship remain inconsistent. **Methods:** We searched the Cochrane Library, PubMed, Web of Science, Embase, Scopus, PsycInfo, and ProQuest databases from inception to September 20, 2024. Two authors independently screened the studies, assessed the quality of the included studies, and extracted data. Any disagreements were resolved through discussion with a third author. A meta-analysis was performed to combine the regression coefficient (B) or odds ratios (ORs) with their confidence intervals. The I^2 statistic was used to quantitatively evaluate the degree of heterogeneity. Stata version 18.0 was used to conduct the meta-analysis, sensitivity analysis, and evaluation of publication bias risk. **Results:** This systematic review and meta-analysis included 27 studies, including 3 prospective and 24 cross-sectional studies. In the cross-sectional studies, as combined effect sizes, the B and OR values revealed a significant association between the experience of workplace bullying and an increased intention to leave (B = 0.25, 95% CI [0.19, 0.31]) (OR = 1.30, 95% CI [1.17, 1.44]). The prospective studies indicated that experiencing workplace bullying is associated with increased turnover intentions over time (B = 0.09, 95% CI [0.01, 0.17]).
Conclusion: Experiencing workplace bullying is positively correlated with employees' increased intentions to leave. This result suggests that to reduce employee turnover in organizations, it is crucial to focus on and prevent workplace bullying.
Sun et al. 2025.
BMC Public Health, vol. 25, no. 1.

Keywords: Meta-analysis; systematic review; turnover intentions; workplace bullying.
Evidence Level: 1A
Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23339-2

Assessment of a workplace training intervention targeting bullying and mental health for construction industry apprentices: A three-pillared approach

Background: Young construction industry apprentices are subjected to routine workplace bullying which has been linked to poor mental health and suicidality, increased substance use, job dissatisfaction, and apprenticeship non-completion. This study aimed to assess the effectiveness of a threefold training intervention program comprised of Apprentice Resilience Training, Supervisor Training, and Toolbox Training, targeting construction apprentices, supervisors, and all trade workers respectively. **Methods:** A cross sectional pre- and post- intervention study was applied to assess the effectiveness of Apprentice Resilience Training, Supervisor Training, and Toolbox Training between July 2023 and February 2024 in Queensland and the Northern Territory, Australia. Data was collected from a sample of 927 construction workers (95 apprentices, 89 supervisors and 743 general trade workers). **Results:** The results provided preliminary evidence for the effectiveness of all three training programs in improving construction workers' attitudes and knowledge in relation to issues around bullying and related topics presented in the sessions. Statistically significant improvements were seen from pre- to post-training on all survey items for both the Supervisor Training and Toolbox Training evaluation, and for the majority of items for the Apprentice Resilience Training evaluation. **Conclusions:** The findings from this study provide encouraging evidence for the effectiveness of the overall bullying intervention program. These findings are important for assessing the effectiveness of specific aspects of the training programs, and also provide a baseline measure against which to compare cohorts of apprentices in the future. The results highlight the importance of the bullying intervention program as a long-term investment in apprentices' future health and wellbeing and reinforce

the need for consistent, ongoing efforts to build workforce resilience and a stronger, more supportive industry culture.
Ross et al. 2025.
BMC Public Health, vol. 25, no. 1.

Keywords: Apprentices; bullying; construction industry; intervention; mental health; suicide.
Evidence Level: 4A
Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23459-9

Psychosocial Issues

Exploring the associations between work addiction, emotional intelligence, psychological detachment, and interpersonal conflicts in young employees

Introduction: Work addiction is a growing concern in modern workplaces, particularly among young employees who face intense competition, high performance expectations, and limited work experience. These challenges not only strain their emotional intelligence and psychological detachment but also intensify interpersonal conflicts, negatively impacting workplace dynamics and well-being. This study explores the associations between work addiction, emotional intelligence, psychological detachment, and interpersonal conflicts, providing a deeper understanding of these interconnected factors among young employees. **Methods:** This study used a questionnaire survey to collect data from young employees aged 18 to 35 in southern China. The research employed convenience sampling and snowball sampling methods, with 362 valid responses collected. SmartPLS software was used for modelling analysis to verify the hypothesized paths, and bootstrapping with 5,000 samples was applied to test the indirect effects. **Results:** The results indicated that all hypotheses were supported. Work addiction was negatively associated with emotional intelligence and psychological detachment, while emotional intelligence was positively associated with psychological detachment. Emotional intelligence and psychological detachment were both negatively associated with interpersonal conflicts. Furthermore, emotional intelligence and psychological detachment were found to mediate the relationship between work addiction and interpersonal conflicts. **Discussion:** The findings highlight the need for organizations to address work addiction by promoting a healthier work culture and supporting employees' emotional and psychological well-being. Encouraging strategies that enhance emotional intelligence and psychological detachment can help mitigate workplace conflicts and improve overall employee relationships.
Sheng et al. 2025.
Frontiers in Public Health, vol. 13.

Keywords: Emotional intelligence; interpersonal conflicts; psychological detachment; work addiction; young employees.
Evidence Level: 4B
Link: https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2025.1631122/full

Relationship between learning examination stress and safety performance among employees in Chinese railway workplace: The moderating role of occupational calling

Workplace learning is prevalent in corporate environments. However, unreasonable workplace learning can induce stress among employees. Based on the Job Demands-Resources (JD-R) theory, this study aims to explore whether the resulting stress constitutes a hindrance job demand when learning tasks in the workplace are overly burdensome and examinations are excessively difficult and whether this stress compromises employees' sleep quality and induces shortcut motivation, thereby reducing safety performance. Data from 723 employees was collected, confirm that both sleep quality and shortcut motivation mediate the impact of workplace learning examination stress on safety performance. The study also introduces occupational calling as a personal resource that mitigates the negative effects of workplace learning examination stress. Our research enriches our understanding of the impact of workplace learning

and occupational calling on safety performance, with significant implications for employee safety and health.
Sun et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: Occupational calling; safety performance; shortcut motivation; sleep quality; workplace learning examination stress.
Evidence Level: 4B
Link: https://www.nature.com/articles/s41598-025-11235-z

Factors influencing job satisfaction among public-sector employees in the united arab emirates: A cross-sectional study

Job satisfaction is a critical factor influencing service quality, organizational success and employee engagement and well-being. This study aims to assess job satisfaction levels, identify key influencing factors, and examine the relationship between burnout and job satisfaction among public sector employees in the Emirate of Sharjah, United Arab Emirates. A cross-sectional survey was conducted across 22 public sector entities in Sharjah from October to December 2023. Participants completed an anonymous self-administered electronic questionnaire involving sociodemographic and work-related characteristics, Minnesota Job Satisfaction Questionnaire (MSQ), and the Maslach Burnout Inventory (MBI). Descriptive statistics, univariate and multivariate logistic regression analyses were employed. A total of 818 full-time employees participated in the survey, with the majority being female (58.1%), UAE nationals (78.9%), married (69.3%), and aged between 31 and 40 years (43.9%). The overall job satisfaction score was 71.7 ± 16.98, reflecting relatively high satisfaction levels, particularly in relation to personal accomplishments, work environment, and compensation. However, aspects such as the perceived value of work, promotion opportunities, and autonomy showed potential for improvement. Sociodemographic factors, including lower income and having children under 12, were associated with reduced satisfaction, while non-UAE citizens reported higher satisfaction. Additionally, professional burnout, especially emotional exhaustion and depersonalization, were strongly correlated with lower job satisfaction. This study highlights the multifaceted factors influencing job satisfaction among public-sector employees in Sharjah. Findings emphasize the need for a collaborative, cross-organizational approach to improve job satisfaction and develop targeted interventions addressing professional burnout. Future research should adopt a longitudinal approach to explore the dynamics between burnout, job satisfaction, and personal factors.
AlMarzooqi et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: Burnout; depersonalization; emotional exhaustion; job satisfaction; personal accomplishment; public sector; United Arab Emirates.
Evidence Level: 4B
Link: https://www.nature.com/articles/s41598-025-98696-4

Unexplored strains and job satisfaction for individuals with visual and auditory impairments: An Italian study

Background: The evidence on job conditions for disabled individuals in the workplace hampers understanding of their needs and the implementation of effective interventions to support their adjustment and integration. The current study contributed to this aim by examining previously unexplored aspects of the adjustment of people with sensory disabilities (PwSD) in bank work settings in Italy. In particular, it investigated for the first time three specific job strains: technostress (TS), cognitive overload (COL), and aging (AG) in PwSD as compared with typical development (PwTD), along with job satisfaction and accessibility. **Methods:** A multidimensional web survey was administered across the Italian national territory to a sample of PwSD (n = 202) and a sample of PwTD (n = 2283). Descriptive statistics were used to highlight perceived satisfaction with accessibility and accommodations in the workplace. A series of linear regression models aimed to measure the association between participants' age and final scores of the TS, COL, and AG questionnaires. A series of non-parametric tests (Mann-Whitney U-tests) were performed to

compare the final COL, TS, and AG scores of PwSD and PwTD. **Results:** At a descriptive level, results highlighted that PwSD's job satisfaction was fairly positive. However, various concerns were brought to light, revealing notable differences between the hearing-impaired and visually impaired cohorts. Moreover, while PwSD displayed reduced scores in the TS questionnaire compared to PwTD, the opposite occurred for the AG questionnaire. Increasing age was related to TS and AG in the PwTD, but only to AG in PwSD. **Conclusions:** Our study investigated for the first time specific job strains in PwSD, thus contributing to a deeper understanding of adjustment to work in a bank worker population. Older adults tend to show higher levels of technostress and a reduced sense of self-efficacy, and these subjective experiences bring together PwTD and PwSD. Moreover, inclusivity and job satisfaction for PwSD, although moderately satisfying, still show several criticisms. Our data can stimulate future research aimed at deepening the work adjustment in PwSD.

Orfei et al. 2025.

BMC Public Health, vol. 25, no. 1.

Keywords: Aging; cognitive overload; quality of life; sensory disabilities; technostress.

Evidence Level: 4B

Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23696-y

Effect of work schedule flexibility as a moderator in the relationship between job stress and wellbeing in pharmacy practice

Hospital pharmacists frequently face significant job stress, adversely impacting their well-being. Work schedule flexibility is often proposed as a potential buffer against job stress, yet its effectiveness among hospital pharmacists remains understudied. This study investigates the moderating effect of work schedule flexibility on the relationship between job stress and well-being among hospital pharmacists in Punjab, Pakistan. A cross-sectional survey was conducted between September 2023 and January 2024, involving 414 pharmacists working in public hospitals in Punjab province. The study utilized standardized scales to measure well-being, stress levels, and work schedule flexibility among the participants. Bivariate correlation and multiple regression analyses examined the relationships and interaction effects among the study variables. Bivariate correlation analysis revealed a negative association between job stress and well-being, a positive association between work schedule flexibility and well-being, and a negative association between work schedule flexibility and job stress. Multiple regression analysis indicated that work schedule flexibility significantly moderated the relationship between job stress and well-being, with the interaction term showing a significant effect. The findings underscore the importance of work schedule flexibility in mitigating the negative effects of job stress on the well-being of hospital pharmacists. Implementing policies that enhance work schedule flexibility may serve as an effective strategy to improve pharmacists' well-being and job satisfaction. Further research is needed to explore these dynamics in healthcare settings and among diverse professional groups.

Rehman et al. 2025.

Scientific Reports, vol. 15, no. 1.

Keywords: Hospital; job stress; Pakistan; pharmacist; well-being; work schedule flexibility.

Evidence Level: 4B

Link: https://www.nature.com/articles/s41598-025-10523-y

Happiness at work in small and medium-sized enterprises: An analysis of innovation and creativity

Background: This study focuses on analysing the relationship between digital innovation, innovation culture, creativity, and happiness at work in the context of small and medium-sized enterprises (SMEs) in Mexico. As digitalisation transforms work processes, it becomes essential to understand how these factors interact and impact employee well-being, especially in emerging economies. **Methods:** The research adopted a non-experimental quantitative approach using a cross-sectional design. A multigroup analysis was applied through Structural Equation Modelling (SEM) to examine the relationships between variables in two groups of companies (small and medium-sized). The sample included 208 workers from various

sectors in Mexico. Likert scale questionnaires, based on validated instruments, were used to measure digital innovation, innovation culture, creativity, and happiness at work. **Results:** The results revealed that digital innovation positively impacts employee creativity, especially in small companies ($\beta = 0.140$, $p < 0.10$), where more flexible structures allow greater autonomy. However, in medium-sized companies, the effect of digital innovation on happiness at work largely depends on an innovation culture ($\beta = 0.533$, $p < 0.001$) that promotes experimentation and collaboration. Creativity has a positive and significant effect on happiness at work ($\beta = 0.447$, $p < 0.001$), highlighting the importance of an organisational environment that values creativity. The model explained 67.2% of the variance in happiness at work, emphasising the crucial role of these variables in enhancing employee well-being. **Conclusions:** The study confirms that the synergy between digital innovation, innovation culture, and creativity is crucial for fostering happiness at work, although the effect varies depending on company size. In small companies, organisational flexibility facilitates the direct effect of digitalisation on creativity and happiness at work. However, in medium-sized companies, a stronger focus on innovation culture is required to maximise these benefits. These findings suggest the need for differentiated strategies to promote organisational well-being across companies of different sizes.

Martinez-Arvizu et al. 2025.

BMC Psychology, vol. 13, no. 1.

Keywords: Creativity; digital innovation; employee engagement; happiness at work; innovation culture; organisational well-being; small and medium-sized enterprises (SMEs); structural equation modeling.

Evidence Level: 4B

Link: https://bmcpsychology.biomedcentral.com/articles/10.1186/s40359-025-02980-x

Organisational and social work environment factors and occupational balance as predictors of work and life satisfaction among Swedish principals who are also parents to small children

Background: In Sweden, managers, individuals working within education, and parents with small children are three groups at high risk for sick leave due to stress-related mental health problems. However, the combined risk of being a parent and manager working within education, i.e., as a principal, on individual work and life satisfaction is not well understood or well-described in the scientific literature. Accordingly, the present study aimed to examine to what extent indicators for occupational balance and organisational and social work environment factors are predictors of work and life satisfaction among Swedish school principals who are also parents to small children. **Methods:** A prospective longitudinal study design was used, and data were collected with a one-year interval (T1 and T2) using a web survey. The participants (n = 149) had at least one child under 8 years old and answered the survey at T1 and T2. Logistic regression analyses were used to estimate how predictors at T1 determined the reporting of work and life satisfaction at T2. **Results:** Supportive organisational structures and few role conflicts at T1 predicted work satisfaction at T2, and supportive organisational structures and a perception of occupational balance at T1 predicted life satisfaction at T2. Adjusted for outcomes at T1, supportive organisational structures and occupational balance still remained predictors. **Conclusions:** Supportive organisational structures that clearly define authority and areas of responsibility, and few role conflicts appear to be important for reporting higher work satisfaction among Swedish principals with small children. In addition, high occupational balance and supportive organisational structures that clearly define authority and areas of responsibility also appear to be important for reporting higher life satisfaction. These results suggest that employers of principals with small children may help them by taking action in the above-mentioned areas. The principals themselves could also benefit from being attentive to these issues. Both are important for strengthening public health and preventing sick leave.

Borgh et al. 2025.

BMC Public Health, vol. 25, no. 1.

Keywords: Managers; parents; psychosocial work environment; work-life balance.

Evidence Level: 4B

Link: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-025-23690-4

Self-management at work's moderating effect on the relations between psychosocial work factors and well-being

Mental health self-management (MHS) strategies may help workers with mental health concerns preserve and enhance their well-being. However, little research has explored how these strategies may help mitigate the effects of negative psychosocial work factors (PWFs) on well-being outcomes. This cross-sectional study investigated (1) the relationship between PWFs and well-being, (2) the association between MHS at work and well-being, and (3) the moderating role of self-management in preventing negative PWFs' deleterious effects. A sample of 896 Francophone workers in Canada completed a questionnaire that included self-reported measures related to workplace, self-management, and well-being. Structural equation modelling (conducted via the MPlus software, version 8.6) revealed that psychological demands were negatively related to positive well-being outcomes and positively associated with adverse well-being outcomes. Competency-related autonomy was positively associated with flourishing, and recognition was positively associated with flourishing and positive well-being at work, as well as being negatively associated with burnout and depression. Surprisingly, supervisor support was negatively related to positive well-being and positively related to burnout and depression. MHS was positively associated with positive well-being at work, flourishing, and work performance, but had no relationship with negative mental health. MHS significantly moderated the relationship between each PWF and well-being at work in both beneficial and adverse ways, depending on the specific well-being indicator being considered. From a workplace well-being perspective, this suggests that although self-management may help workers preserve and enhance their positive well-being, organizations must also directly target PWFs to prevent negative well-being outcomes.

Gauthier et al. 2025.

International Journal of Environmental Research and Public Health, vol. 22, no. 7.

Keywords: Mental health self-management; positive mental health; psychological health; psychosocial work factors; self-care; self-management strategies; workplace well-being.

Evidence Level: 5B

Link: https://www.mdpi.com/1660-4601/22/7/1070

High-performance work systems, psychological empowerment, and power distance orientation in shaping employee innovation, a moderated mediation model

This study examines the impact of High-Performance Work Systems on the Innovative Behaviour of IT employees in China's smartphone industry, drawing on Social Cognitive, Psychological Empowerment, and Social Information Processing Theories. Using a mixed-methods approach that combines Structural Equation Modelling and Fuzzy-Set Qualitative Comparative Analysis, this study is based on survey data from 481 full-time IT employees from leading smartphone companies in China. A moderated mediation model is developed to reveal how High-Performance Work Systems enhance employees' perceptions of work meaning, competence, work impact, and self-determination, thereby fostering Innovative Behaviour. Notably, Power-Distance Orientation moderates the relationship between High-Performance Work Systems and Innovative Behaviour, particularly in terms of work meaning and competence. In high Power-Distance Orientation contexts, employees are more inclined to defer to authority, which reduces the motivational effect of High-Performance Work Systems on Innovative Behaviour. The findings highlight the importance of optimizing human resource management practices to strengthen psychological empowerment, as a means of enhancing innovation and overall organizational performance. This study offers valuable practical implications for the highly competitive and rapidly evolving smartphone industry, providing insights into how organizations can effectively leverage High-Performance Work Systems to drive innovation.

Li et al. 2025.

Scientific Reports, vol. 15, no. 1.

Keywords: High-performance work system; innovative behavior; power-distance orientation; psychological empowerment.

Evidence Level: 5B

Link: https://www.nature.com/articles/s41598-025-08522-0

Asbestos exposure assessment for ceiling tile removal using glove bags in small indoor facilities
This study aimed to evaluate the safety of small-scale asbestos dismantling and removal work, especially ceiling tile removal using glove bags (GBs), and to investigate the potential for asbestos dispersion in GBs during ceiling material removal to propose safe work practices and related regulations. Asbestos exposure assessment was conducted at five asbestos-containing ceiling tile dismantling sites nationwide. Air sampling was performed during ceiling tile removal at four points per site: near workers' respiratory tract, at the GB fixed boundary, inside the GB, and within the general work area. Phase contrast microscopy was applied to determine asbestos. The results indicated that airborne asbestos concentrations varied by region, with the highest levels detected inside the GB. Elevated concentrations were also observed near workers' respiratory tract. During ceiling tile removal, asbestos concentrations increased as the number of ceiling tiles removed rose from one to three. Proper sealing of asbestos dust to prevent leakage from the GB is essential, and removing ceiling tiles individually rather than in batches effectively reduces asbestos concentrations.
Hwang et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: Asbestos; ceiling tile; glove-bag; small indoor facilities.
Evidence Level: 5B
Link: https://www.nature.com/articles/s41598-025-06762-8

Fostering Work Participation

Return to Work

Predictors of return-to-work after thyroid cancer surgery based on random forest model: A cross-sectional study
Background: Thyroid cancer (TC) is the most prevalent malignancy among middle-aged and young adults. Many patients will face the challenge of return-to-work (RTW) after TC surgery. If patients cannot return to work successfully, it may affect their social recovery and quality of life. This study used the random forest algorithm to identify the predictors of RTW after TC surgery. **Methods:** A cross-sectional study was conducted, encompassing a sample of 242 patients who underwent TC surgery in Zhujiang Hospital of Southern Medical University from April to December 2023. The participants completed questionnaires including the general information questionnaire, the Return-To-Work Self-Efficacy Questionnaire (RTW-SE), the Cancer Fatigue Scale (CFS), and the Vancouver Scar Scale (VSS). In this study, the predictors of RTW after TC surgery were analyzed by univariate analysis, multiple logistic regression, and random forest model (RFM). **Results:** The final 229 TC patients were included in this study, of which 183 (79.9%) returned to work, of which 46 (20.1%) failed to return to work. The median time of RTW was 30.00(14.00, 33.75) days after TC surgery. The RFM indicated that RTW-SE was a key predictor related to RTW after TC surgery and other predictors were ranked in order of importance as follows: postoperative time, neck scar (NS), medical insurance, complications, and rehabilitation exercise. **Conclusions:** 20.1% (46/229) of patients still failed to return to work after TC surgery. Healthcare professionals ought to emphasize the importance of modifiable factors, improving TC patients' RTW-SE, reducing the formation of NS, minimizing the occurrence of complications, and promoting rehabilitation exercise may help to facilitate RTW after TC surgery.
Tang et al. 2025.
BMC Surgery, vol. 25, no. 1.

Keywords: Random forest model; return to work; self-efficacy; thyroid cancer surgery.
Evidence Level: 4B
Link: https://bmcsurg.biomedcentral.com/articles/10.1186/s12893-025-02901-0

Presenteeism and Absenteeism

The impact of employment status, income, and occupation on the association between workplace benefits and health-related work absences

Background: Workplace benefits such as paid sick leave and employer-sponsored health insurance influence workers' ability to take time off when ill or injured. We examined whether and to what extent these workplace benefits complement each other in affecting health-related work absences, and whether associations varied by employment status, income, and occupation. **Methods:** This cross-sectional study analysed pooled data from the 2021 and 2023 National Health Interview Survey (NHIS), a nationally representative survey of US adults. The sample included 31,280 employed adults. Workers were classified into four workplace benefits groups: paid sick leave only, employer-sponsored health insurance only, both benefits, and neither benefit. The primary outcome was health-related work absence in the past 12 months. Interaction terms assessed differences in probability of absence by employment status (full-time vs. part-time), income (< 400% vs. ≥ 400% of the federal poverty level), and occupation type (Management, Professional, Service, Sales, and Production). **Results:** Compared to those with neither benefit, the probability of work absence was 7.3 points higher with employer-sponsored health insurance only ($p < 0.001$), 4.6 points higher with paid sick leave only ($p = 0.002$), and 12.0 points higher with both benefits ($p < 0.001$). The association between workplace benefits and health-related work absence varied by employment status, income level, and occupation type ($p < 0.001$ for all interactions).
Conclusions: Access to paid sick leave and health insurance increased the likelihood of taking time off due to illness or injury, with differences by employment status, income, and occupation.
Stimpson et al. 2025.
American Journal of Industrial Medicine, vol. 68, no. 7.

Keywords: Absenteeism; employment status; health insurance; income; injury; occupations; sick leave; workplace.
Evidence Level: 4B
Link: https://onlinelibrary.wiley.com/doi/10.1002/ajim.23733

Premenstrual disorders and risk of sick leave and unemployment: A prospective cohort study of 15 857 women in Sweden

Background: Premenstrual disorders (PMDs) are prevalent and impair women's quality of life, but their long-term influence on work capacity is unclear. Understanding the association between PMDs and subsequent sick leave and unemployment could inform interventions and policies. **Objective:** We hypothesised that women with PMDs have an increased risk of future sick leave and unemployment compared with those without PMDs. **Methods:** We conducted a prospective cohort study involving 15 857 women aged 15-60 years who were employed at baseline in the LifeGene Study, with linkage to population and health registers in Sweden. PMDs were identified from clinical diagnoses and symptom questionnaires; sick leave and unemployment data were obtained from national registers. Poisson regression estimated incidence rate ratios (IRRs) for sick leave and unemployment in women with versus without PMDs.
Findings: A total of 2585 (16.3%) women (mean age 32.5 years) had probable PMDs. Over a median 9.17-year follow-up, 6741 (42.5%) and 1485 (9.4%) experienced at least one sick leave or unemployment, respectively. Compared with women without PMDs, those with PMDs had a 40% higher risk of sick leave (IRR 1.40, 95% CI 1.31 to 1.49) and a 27% higher risk of unemployment (IRR 1.27, 95% CI 1.10 to 1.46). Risk elevations were pronounced for sick leave≥90 days (IRR 1.69, 95% CI 1.50 to 1.91) and depression-related sick leave (IRR 1.41, 95% CI 1.27 to 1.56). **Discussion:** Women with PMDs are at increased risk of sick leave and unemployment, suggesting significant long-term socioeconomic burden associated with PMDs.
Clinical implications: This study underscores the need for greater awareness of PMDs in clinical practice. Healthcare providers should recognise the potential impairment at work associated with PMDs, especially in women with recurrent symptoms or comorbidities like anxiety or depression.
Yu et al. 2025.
BMJ Mental Health, vol. 28, no. 1.

Keywords: Adult psychiatry; Depression and mood disorders.
Evidence Level: 4B
Link: https://mentalhealth.bmj.com/content/28/1/e301550

Wellness Programs

Impact of an intersectoral universal workplace intervention on health related quality of life and wellbeing in a pragmatic cluster randomised trial

The intersectoral workplace intervention "health in work" (HIW), developed by the Norwegian healthcare service and labour and welfare administration, targets common musculoskeletal and mental health conditions by addressing both health and work environment factors. This study assessed the effectiveness of HIW on workers' health-related quality of life (HRQoL) and subjective wellbeing (SWB) compared to standard inclusive work measures (IWM). A pragmatic cluster randomised controlled trial including 97 workplaces, randomized to either the HIW or IWM intervention over 12 months. HRQoL was measured using the EQ-5D-5L and the EQ-VAS, and SWB by using the satisfaction with life scale and a question on meaningful life. Measurements were taken at baseline, post-intervention period, and at a 12-month follow-up. EQ-5D-5L data were analysed using mixed-effects generalized linear models. No statistically significant difference-in-difference in HRQoL or SWB were found between the HIW and IWM groups at any time point. Participants in both groups reported high baseline levels of HRQoL and SWB. Although HIW did not yield significant improvements or detriments in HRQoL or SWB, this study contributes to addressing the knowledge gap regarding intersectoral collaboration in enhancing work and health. Further research is needed to assess broader outcomes such as healthcare utilisation and sick leave. Trial registration: The trial was prospectively registered with ClinicalTrials.gov on June 24, 2019, under the identifier NCT04000035.
Terjesen et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: EQ-5D; HRQoL; health promotion; mental health; musculoskeletal complaint; occupational health literacy; subjective well-being.
Evidence Level: 2B
Link: https://www.nature.com/articles/s41598-025-12221-1

Effect of minimal individual or group enhancement in an eHealth program on mental health, health behaviour, and work ability in employees with obesity: Randomized controlled trial

Background: Mental health problems and adverse health behaviours are enriched in individuals with obesity and need to be considered in weight loss interventions. Regarding weight loss, hybrid interventions combining digital and in-person elements have proven superior to eHealth-only interventions. However, it remains unclear whether minimal group or individual enhancement could bring additional benefits to the mental health and health behaviour domains in individuals with obesity. **Objective:** This study aimed to explore whether minimal group or individual enhancements could offer additional benefits to an eHealth intervention in relation to mental health, perceived work ability, and health behaviour in a sample of occupational health patients with obesity. In addition, the study sought to examine the overall effects of the health behaviour-focused intervention across these domains. **Methods:** This study was a randomized controlled trial with a 12-month intervention (March 2021-2022), with selected variables followed for another 12 months without additional support. Recruited from occupational health care, 111 working-age adults with BMI 30-40 kg/m2 were randomized to one of the 3 treatment arms, such as eHealth, eHealth+Group, or eHealth+Individual. All treatment arms received a web-administered, coach-assisted eHealth program based on acceptance and commitment therapy, and, in addition, the eHealth+Group and eHealth+Individual arms received 3 remotely facilitated group or individual meetings. The overall intervention effects were evaluated quasi-experimentally by combining the 3 treatment arms into a single eHealth arm. Participants were assessed for depression (the Beck Depression Index 21 [BDI-21]), burnout (Bergen Burnout Inventory 18 [BBI-15]), perceived work ability, eating behaviour (ecSatter 2.0, Three Factor

Eating Questionnaire [TFEQ], and Binge Eating Scale [BES]), and physical activity (Baecke Habitual Physical Activity Questionnaire, BHPAQ). **Results:** We observed inconsistent fluctuations between the treatment arms in depression and burnout scores, indicating a lack of meaningful intervention effects despite statistical significance. Therefore, none of the treatment arms showed superiority over another. Across all participants, depression showed an estimated mean decrease of 2.5 BDI-21 points, with older participants experiencing a greater reduction in depressive symptoms. Furthermore, binge eating tendency decreased by 4.9 BES points during the 12-month intervention. We also observed increases in eating competence, controlled restraint, and physical activity. However, the 24-month measurements showed an adverse effect on eating competence, especially on attitudes toward eating and food, during the follow-up period without further support. **Conclusions:** Minimal enhancement through either group or individual video-conference meetings did not provide additional benefits in the mental health or eating habit domains compared with the eHealth intervention alone. Nevertheless, our results indicate that eHealth interventions for weight loss have the potential to reduce depression symptoms and binge-eating tendencies, while also improving eating competence and physical activity across the study population. Continued support may be necessary to sustain positive changes.

Männistö et al. 2025.

JMIR Mental Health, vol. 12.

Keywords: ACT; RCT; acceptance and commitment therapy; burnout; coach; coaching; controlled trial; eHealth; eating habits; health behavior; health intervention; mental health; obese; obesity; occupational health; psychotherapy; weight management.

Evidence Level: 2B

Link: https://mental.jmir.org/2025/1/e66518

Enhancing occupational health literacy in the context of SDGs: Evidence from Sicilian workers

Objectives: This study aims to investigate the levels of Occupational Health Literacy (OHL) among workers in Sicilian companies and identify key predictors of elevated OHL. The research also seeks to highlight the role of OHL in promoting workplace health, reducing inequalities, and contributing to the Sustainable Development Goals (SDGs), particularly SDG 3 (Health and well-being) and SDG 4 (Quality education). **Study design:** A cross-sectional study was conducted over a three-month period, from September to December 2024, involving a sample of 796 workers from various Sicilian companies. **Methods:** Participants completed three validated questionnaires: the Occupational Health Literacy Scale (OHLS), the Work Productivity and Activity Impairment Questionnaire (WPAI-GH), and the EQ-5D for assessing quality of life. Logistic regression models were employed to analyse the data and identify predictors associated with elevated OHL levels. **Results:** Among the participants, 28.8 % demonstrated high levels of OHL, whereas 71.1 % exhibited insufficient levels. Key determinants of elevated OHL included age, gender, and education. Higher education was significantly associated with high OHL levels ($p < 0.001$). **Conclusions:** The study underscores the importance of targeted educational interventions to enhance OHL, thereby fostering workplace health and supporting the achievement of SDGs. These findings call for further research to address regional disparities and promote sustainable occupational health and safety practices.

Malta et al. 2025.

Public Health, vol. 244.

Keywords: Health literacy assessment; Occupational health literacy (OHL); Occupational safety and health (OSH); Sustainable development goals (SDG); workplace health promotion.

Evidence Level: 4B

Link: https://www.sciencedirect.com/science/article/pii/S0033350625001842?via%3Dihub

Organizational Issues

Exploring the link between healthcare organizational culture and provider work satisfaction: A systematic review

Background: Organizational culture and work satisfaction are fundamental domains important for a good working environment and are closely linked to employees' work performance and well-being in healthcare environments. Although organizational culture is critical, research on how and what domains affect work satisfaction in the healthcare sector remains scattered. By combining the literature, this review will offer significant insights into which factors significantly influence work satisfaction in the healthcare sector. It will also map the literature on this subject, identifying key patterns, gaps, and inconsistencies that can direct future research directions. **Methods:** Our review complied with the Systematic Review and Meta-Analysis Statement's Preferred Reporting Items. This review used three databases for the literature search (PubMed, Scopus, and Web of Science). The literature search focused on more recent published studies between 2014 and 2024, and the search was conducted in November 2024. Two authors evaluated the bias of studies using a risk of bias template, a critical appraisal tool for use in JBI Systematic Reviews, to assess the risk of bias and the paper's quality. Studies were analysed and compiled based on the classification of work satisfaction and the direction of the relationship. **Results:** Six themes of value related to organizational culture were formulated among the included studies to synthesize their associations with work satisfaction. The themes tied to organizational culture were 1) continuous communication, 2) organizational leadership, 3) teamwork, 4) employee involvement in decision-making, 5) employee recognition, and 6) autonomy. **Conclusion:** Implementing strategies tailored to each theme may increase work satisfaction, foster improved organizational performance, increase retention, and improve the quality of patient care. This may serve as a crucial element in forthcoming healthcare system reforms, aiming to harmonize the requirements of providers and recipients alike.

Rafi'I et al. 2025.
BMC Health Services Research, vol. 25, no. 1.

Keywords: Administrative; climate; contentment; enjoyment; health; service provider.
Evidence Level: 1A
Link: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-025-12973-6

The impact of corporate social responsibility on employee safety citizenship behaviour in Chinese gas sector

Drawing upon the Affective Events Theory (AET), we exam how and under what conditions corporate social responsibility (CSR) in gas companies relates to more employee safety citizenship behaviour (SCB). In Study 1, a scenario-based experiment involving 481 gas company employees revealed that CSR initiatives positively influenced employee gratitude and SCB. Furthermore, the interaction between CSR and performance pressure significantly enhanced both employee gratitude and SCB. In Study 2, a multi-wave survey study of 370 gas company employees demonstrated that employee gratitude not only directly and positively predicted SCB but also mediated the relationship between CSR and SCB. Notably, the mediating effect of gratitude was more pronounced under conditions of low performance pressure. These findings advance theoretical understanding of the mechanisms linking CSR to safety outcomes and offer actionable insights for gas companies aiming to optimize CSR strategies to foster safer workplace behaviours.

Miao et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: Corporate social responsibility; employee gratitude; employee safety citizenship behavior; performance pressure.
Evidence Level: 4B
Link: https://www.nature.com/articles/s41598-025-12083-7

Prioritizing organizational success and the pursuit of victory: Understanding the feelings of exclusion in the workplace

This study investigates how an organizational bottom-line mentality (BLM) climate influences employee perceptions of workplace ostracism, with a focus on the moderating role of zero-sum beliefs (ZSB). Using a survey of 220 full-time respondents in the United States, we conducted regression analysis and moderated mediation tests via Hayes' PROCESS macro in R. We measured perceived organizational BLM, employee BLM, ZSB, and work ostracism using validated scales. The results supported all five hypotheses. An organizational BLM climate positively influences employee BLM, which in turn increases perceptions of ostracism. This relationship is stronger for employees with high ZSB. Additionally, the indirect effect of an organizational BLM climate on ostracism through employee BLM is significantly moderated by ZSB. The findings highlight that employees with high ZSB experience greater ostracism in high-BLM environments. Drawing on Social Cognitive Theory (SCT) this study investigates and underscores the negative interpersonal outcomes of a BLM climate. By addressing zero-sum beliefs through targeted interventions, organizations can balance financial objectives with employee well-being, enhancing workplace dynamics and morale.

Keeler et al. 2025.

Acta Psychologica, vol. 257.

Keywords: Bottom-line mentality; group dynamics; workplace ostracism; zero-sum belief.

Evidence Level: 5B

Link: https://www.sciencedirect.com/science/article/pii/S0001691825004627?via%3Dihub

Job Design

Approach or avoidance? Relationship between perceived AI explainability and employee job crafting

Amid growing concerns about the lack of transparency in algorithms, heightened focus has been placed on artificial intelligence (AI) explainability in workplace decision-making processes. This study leverages work design theory to explore when and how perceived AI explainability impacts two types of employee job crafting: approach job crafting and avoidance job crafting. We analysed multi-wave survey data of 278 medical staff to examine the effects of perceived AI explainability on approach and avoidance job crafting through a dual-pathway model. Results indicated that perceived AI explainability enhanced AI-oriented benefit perception and reduced AI-oriented threat perception, resulting in an increase in approach and avoidance job crafting. Furthermore, our findings suggested that ethical climate strengthened the impacts of perceived AI explainability on AI-oriented benefit perception and AI-oriented threat perception. We discuss key theoretical insights of our findings for advancing AI and job crafting research as well as implications for organisational practice.

Huo et al. 2025.

Acta Psychologica, vol. 257.

Keywords: Approach job crafting; avoidance job crafting; ethical climate; perceived AI explainability; work design.

Evidence Level: 5B

Link: https://www.sciencedirect.com/science/article/pii/S000169182500410X?via%3Dihub

Shift Work

Shift workers' experiences and views of sleep disturbance, fatigue and healthy behaviours: A systematic review and qualitative evidence synthesis

Objective: Shift work is common across most societies but poses significant risks to the health of shift workers. In part, this risk is due to the disruption of healthy sleep-wake schedules. This systematic review identified qualitative research on shift workers' experiences of sleep disturbance, fatigue and healthy behaviours. **Methods:** We conducted a systematic search of four databases (CINAHL, EMBASE, MEDLINE, PsycINFO) and identified 28 eligible studies involving 1519 participants. We appraised the studies using an adapted Critical Appraisal Skills Programme (CASP) checklist, and confidence in the review findings was formally assessed using the Grading of Recommendations Assessment, Development and Evaluation-Confidence in the Evidence from Reviews of Qualitative research (GRADE-CERQual) approach. Data were thematically synthesized. **Results:** Three analytical themes were generated. 'Inevitability of fatigue and tiredness' outlines how shift workers experience a culture where they feel "peer pressure to soldier through" their shifts regardless of fatigue. 'Balancing sleep needs with competing responsibilities' highlights how shift workers struggle to balance the need for daytime sleep with family, leisure, and work responsibilities, often prioritizing family needs over their own sleep. 'Obstacles to engaging in healthy behaviours' describes how shift workers often know which actions would benefit their health and reduce fatigue but find it challenging to translate this knowledge into behaviour due to fatiguing and stressful work environments. For the purposes of the GRADE-CERQual assessment, short summary statements were developed to describe 22 review findings: there was moderate or high confidence in all but one of these findings. **Conclusion:** This review suggests that sleep education alone is unlikely to be effective. Interventions should focus on helping shift workers self-regulate their behaviours, thoughts, and emotions to better manage sleep and fatigue.

Benton et al. 2025.
Scandinavian Journal of Work, Environment and Health, vol. 51, no. 4.

Keywords: Sleep disturbance; fatigue; healthy behaviors; shift workers.
Evidence Level: 1A
Link: https://www.sjweh.fi/article/4223

Night shift work and indicators of cardiovascular risk: A systematic review and meta-analysis

Cardiovascular disease (CVD) is a leading cause of death worldwide, and shift workers have an increased risk of CVD. This comprehensive systematic review and meta-analysis aimed to assess the association between night shift work and cardiovascular risk indicators. A systematic literature search was performed according to the PRISMA 2020 guidelines using Medline, Embase, and Web of Science databases from inception through May 2024. Original manuscripts reporting relevant cardiovascular risk indicators and biomarkers in night shift workers were included. Risk of bias was assessed using the JBI's critical appraisal tools. When applicable, random-effect meta-analyses were performed. If suitable data were not available, a narrative synthesis was performed by combining p-values or vote-counting. Meta-regression analyses were performed to assess the contribution of sex, body mass index, and age as possible modifiers of effect. Evidence was weighed using an adapted GRADE. This study is registered in PROSPERO (CRD42022337285). Of the 8,387 studies identified, 81 were included in the synthesis, comprising 14 cohort and 67 cross-sectional studies. Moderate-confidence evidence was presented demonstrating increased inflammation, dyslipidaemia and impaired cardiac excitability among night shift workers. Dose-dependent effects were reported for these cardiovascular risk indicators, suggesting that the intensity and duration of night shift work contribute to risk of CVD. Furthermore, no association between night shift work and indicators of vascular dysfunction, deregulation of the autonomic nervous system, or altered homeostasis was observed. Considering this, regulatory and preventative initiatives are essential to reduce the cardiovascular risk among night shift workers.

Erdem et al. 2025.
Environmental Research, vol. 276.

Keywords: Cardiovascular events; dyslipidaemia; inflammation; occupational; risk indicators; shift work.
Evidence Level: 1A
Link: https://www.sciencedirect.com/science/article/pii/S0013935125007546?via%3Dihub

Intermittent fasting for weight loss in night shift workers: A three-arm, superiority randomised clinical trial

Background: Weight gain and an increased risk of developing type 2 diabetes are recognised consequences of night shift work. We tested the effectiveness of two modified intermittent fasting (IF) strategies compared with continuous energy restriction (CER) on weight loss and improvements in insulin resistance in night shift workers. **Methods:** A parallel group, three-arm randomised superiority clinical trial (Melbourne and Adelaide) recruited night shift workers (aged ≥ 25 and ≤ 65 years) with overweight/obesity. Participants were randomised by minimisation (site, age, gender) 1:1:1 to CER or one of two modified IF strategies. For 24 weeks participants followed a diet of 2100 kJ/d for two days of the week (modified IF) either on days off/day shift (IF:2D) or whilst on night shift (IF:2N) and followed their usual diet on the remaining five days. Co-primary outcomes were body weight and insulin resistance measured by the Homeostatic Model Assessment for Insulin Resistance (HOMA-IR) at 24-weeks. Participants and those assessing weight outcomes were not blinded to group assignment. Researchers assessing biochemical outcomes and study statistician were blinded to group assignment. Between-group differences were calculated using mixed-effects regression models. **Findings:** From October 2019 to February 2022, 250 participants (CER = 85; IF:2D = 83; IF:2N = 82) were randomised (mean (SD) age 46.8 (9.8) years; 133 women (53.2%)), with 170 (68%) completing. No significant difference between either modified IF strategy and CER for body weight; IF:2D vs CER (mean difference (MD) = -0.2 kg [95% CI -6.4 to 5.9]) and IF:2N vs CER (MD = -0.6 kg [95% CI -6.8 to 5.6]) and insulin resistance; IF:2D vs CER (MD = -0.1 [95% CI -1.0 to 0.8]) and IF:2N vs CER (MD = -0.3 [95% CI -0.5 to 1.2]) were observed. For secondary outcomes, those randomised to IF:2D had lower total and LDL cholesterol compared to CER ((MD = -23.2 mg/dL [95% CI -34.8 to -11.6]) and (MD = -19.3 mg/dL [95% CI -30.9 to -7.7]) respectively). In a completer's analysis, favourable changes in body weight, insulin resistance, body composition, blood pressure, and cardiometabolic markers were observed within all groups. No serious trial related adverse events were reported. **Interpretation:** At 24 weeks, weight and HOMA-IR were not different between the modified IF groups compared with CER. Clinically significant improvements in weight and metabolic health were achieved for the majority of night shift workers who remained in the intervention at 24 weeks.
Bonham et al. 2025.
eBioMedicine, vol. 117.

Keywords: Continuous energy restriction; diet intervention; intermittent fasting; obesity; shift work; weight loss.
Evidence Level: 2A
Link: https://www.thelancet.com/journals/ebiom/article/PIIS2352-3964(25)00247-6/fulltext

Management and Leadership

Effectiveness of leader-targeted stress management interventions: A systematic review and meta-analysis

Objective: Based on the well-documented role of supervisors` in fostering healthy workplaces and managing the impact of work-related stress, the aim of this study was to determine the effectiveness of leader-targeted stress management interventions (SMI) on their psychological stress, mindfulness, mental health, and work- and leadership-related outcomes. **Methods:** Eligible studies, including randomized controlled trials or controlled before-after studies, examining the effects of leader-targeted SMI on supervisors` psychological stress, mindfulness, mental health, and work- and leadership-related outcomes, were identified in four electronic databases and supplemented by manual search strategies. Screening for

eligibility, data extraction, risk of bias assessment, and certainty of evidence grading, following PRISMA guidelines and Cochrane Handbook recommendations, were done in duplicate. Data were pooled in random effects models to synthesize g-scores. Sensitivity and moderator analyses were used to assess the robustness of the results and explore potential sources of heterogeneity. **Results:** The 25 studies (N=2466 participants) meeting the full inclusion criteria varied widely in population characteristics, intervention types, duration, delivery methods, and examined outcomes. The overall intervention effect was g=0.13 [95% confidence interval (CI) -0.24- -0.01] after excluding outliers. Significant intervention effects were found for mental health [g=-0.38 (95% CI -0.69- -0.08)] and, after excluding influential cases, work- [g=-0.32 (95% CI -0.63- -0.00)] and leadership-related outcomes [g=-0.23 (95% CI -0.44- -0.02)].
Conclusion: Our meta-analysis suggests that leader-targeted SMI can be an effective approach for promoting occupational health.
Dannheim et al. 2025.
Scandinavian Journal of Work, Environment and Health, vol. 51, no. 4.

Keywords: Stress management; interventions; healthy workplaces.
Evidence Level: 1A
Link: https://www.sjweh.fi/article/4219

How and when servant leadership affect public employees' innovative behaviour

Drawing on job demands-resources theory, this study explains the underlying mechanism by which servant leadership affects public employees' innovative behaviours. Building upon this foundation, the study constructs a hypothesized theoretical model positioning psychological safety as the mediator and public service motivation as the moderator. Through institutional cooperation with graduate schools at two universities in Yunnan Province, China, a survey was administered to 680 Master of Public Administration students, yielding 642 valid responses for analysis. Based on a sample of 642 public employees from public organizations in China, servant leadership was found to positively affect public employees' psychological safety and innovative behaviours. Psychological safety partially mediated the relationship between servant leadership and innovative behaviours. Furthermore, public service motivation moderated the link between psychological safety and innovative behaviours. These findings suggest that public organizations must develop and train servant leaders using various strategies to establish and maintain a psychologically safe work environment conducive to innovation and also should attach importance to the significant role of public service motivation in enhancing innovative behaviours among public employees.
Xiao et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: Innovative behavior; psychological safety; public service motivation; servant leadership.
Evidence Level: 4B
Link: https://www.nature.com/articles/s41598-025-11504-x

Expanded span of control, leadership and management performance, work-related stress, and job satisfaction among first-line managers: A repeated cross-sectional study

Background: First-line healthcare managers navigate complex organizational demands to ensure a good work environment and quality care. Key factors such as expanded span of control, leadership and management performance, and work-related stress significantly influence their job satisfaction. However, how these factors evolve over time in organizational settings remains unclear. **Objective**: To examine expanded span of control, leadership and management performance, work-related stress, and job satisfaction among first-line healthcare managers and assess whether the relationships between these variables remained stable over time. **Methods**: A repeated cross-sectional design was used to collect annual data from 2020 to 2023 among first-line managers in a Swedish healthcare organization. The Ottawa Hospital Span of Control tool, the Leadership and Management Inventory, the Health & Safety Executive stress tool, and a single-item job satisfaction measure were used to collect data. Kruskal-Wallis tests and Spearman correlation analysis were performed. **Results**: An expanded span of control negatively impacted job satisfaction in certain years. Leadership and management performance showed a positive but

inconsistent association with job satisfaction. Factors in work-related stress, particularly high demands and strained relationships, consistently had a negative relationship with job satisfaction, whereas control and support positively contributed to greater job satisfaction. **Conclusions**: Work-related stress, driven by high demands and poor relationships, significantly decreases job satisfaction. Leadership and management performance influence satisfaction, but inconsistently. Reducing workload and improving support structures can enhance job satisfaction and managerial effectiveness.
Svanström et al. 2025.
Work, vol. 81, no. 3.

Keywords: First-line manager; job satisfaction; leadership; management; span of control; work-related stress.
Evidence Level: 4B
Link: https://pubmed.ncbi.nlm.nih.gov/40179141/

Uncivil customers and work-family spillover: Examining the buffering role of ethical leadership

Background: This study investigates the impact of customer incivility on employee burnout and work-family conflict, examining the moderating role of ethical leadership in these relationships within the service industry. By integrating the Conservation of Resources theory and Role Theory, we seek to provide a more comprehensive understanding of how negative customer interactions affect employee well-being beyond the immediate work setting. **Methods:** We conducted a two-wave, time-lagged survey among 586 full-time service sector employees in South Korea. The data were analysed using confirmatory factor analysis and hierarchical regression to test the hypothesized relationships between customer incivility, burnout, work-family conflict, and ethical leadership. **Results:** Our results reveal a positive relationship between customer incivility and work-family conflict, which is mediated by burnout. Furthermore, we found that ethical leadership moderates the relationship between customer incivility and burnout, such that the positive relationship is weaker when ethical leadership is high. **Conclusion:** By integrating Conservation of Resources theory and Role Theory, this study provides a comprehensive understanding of how negative customer interactions affect employee well-being beyond the immediate work setting. The results highlight the spillover effects of customer incivility on employees' personal lives and the importance of ethical leadership in mitigating these effects. This research offers valuable insights for developing targeted interventions to enhance employee well-being, work-family balance, and organizational effectiveness in service industries.
Jeong et al. 2025.
BMC Psychology, vol. 13, no. 1.

Keywords: Burnout; customer incivility; ethical leadership; work-family conflict.
Evidence Level: 5B
Link: https://bmcpsychology.biomedcentral.com/articles/10.1186/s40359-025-02944-1

E-leadership drives employee creativity through emotional exhaustion with regulatory focus as a moderator

In the digital age, e-leadership has emerged as a critical driver of employee creativity, yet the underlying mechanisms and boundary conditions remain underexplored. This study aimed to elucidate the relationship between E-leadership and employee creativity by examining the mediating role of emotional exhaustion and the moderating influences of promotion and prevention regulatory foci. Data were collected via a questionnaire survey administered to 366 employees within China's Information and Communication Technology (ICT) sector, and the data were analysed using hierarchical regression and bootstrapping techniques. Results demonstrate that E-leadership influences creativity through multiple concurrent pathways: a direct positive effect (β = 0.28, p 0.01, accounting for 66.7% of total effect) and an indirect effect mediated through reduced emotional exhaustion (β = 0.14, 95% CI [0.08, 0.21], representing

33.3% of total effect). These relationships are significantly moderated by regulatory focus, with promotion focus attenuating the negative association between E-leadership and emotional exhaustion (interaction β = 0.14, p = 0.01) and prevention focus exacerbating the detrimental impact of emotional exhaustion on creativity (interaction β = -0.20, p 0.01). These findings advance leadership theory by revealing how cognitive-motivational factors shape e-leadership effectiveness, with practical implications for mitigating burnout in technology-mediated work environments.
Zhao et al. 2025.
Scientific Reports, vol. 15, no. 1.

Keywords: E-leadership; emotional exhaustion; employee creativity; preventing regulatory focus; promoting regulatory focus.
Evidence Level: 5B
Link: https://www.nature.com/articles/s41598-025-05131-9

Work Ability

Determinants of sustainable work participation after spinal cord injury in The Netherlands

Purpose: Work participation of persons with spinal cord injury (SCI) is lower compared to the overall Dutch population, with determinants largely unknown. **Aim:** To identify the determinants of sustainable work participation for persons with SCI. **Methods:** A cross-sectional multicentre study was conducted in eight Dutch rehabilitation centres. Persons with first inpatient rehabilitation, discharged between 2015 and 2022, and a work participation goal were invited to complete a survey. Statistical analyses compared groups based on having paid work (yes/no), work functioning (good/lower), past sick leave (occasional/frequent), and expected sick leave (occasional/frequent). Variables that significantly differed were added in logistic regression analyses, and goodness of fit of the model was estimated using Nagelkerke pseudo R-square. **Results:** In total, 175 persons responded (69.7% male, 51.1 ± 12.8 years, time since injury 4.2 ± 2.7 years). The paid work model accounted for 24.5% of the variance ($p < .001$). The work functioning model accounted for 48.1% ($p < .001$), with work ability as a significant contributor. The model for past sick leave accounted for 23.5% ($p = .009$). The model for expected sick leave accounted for 36.4% ($p < .001$), with work ability as a significant contributor. **Conclusions:** Lower self-reported work ability was associated with a higher chance of lower work functioning and expected frequent sick leave. Implications for rehabilitation. A lower self-reported workability was associated with a higher chance of lower work functioning and expected frequent sick leave for the next year. The Work Ability Index - Single Item (WAS) can be considered for use in the clinical setting to assess work functioning and sick leave expected in the next year. A low WAS value should be discussed with the patient, and if needed with the vocational rehabilitation team and/or the employer to enable adequate intervention(s).
van Dinter et al. 2025.
Disability and Rehabilitation, vol. 47, no. 15.

Keywords: Return to work; maintain at work; paid work; sick leave; work functioning.
Evidence Level: 4B
Link: https://pubmed.ncbi.nlm.nih.gov/39615033/

Concurrent trajectories of occupational groups and sustainable working life: A Swedish twin cohort study over 16 years

We aimed to examine concurrent trajectories of occupational groups and level of sustainable working life, and individuals' characteristics as predictors for the trajectories. National register data from 81,388 Swedish twins born in 1925-1990 included occupational groups. To define the level of sustainable working life, employment, unemployment, sickness absence, and disability pensions in 2001-2016 were used. Group-based multi-trajectory modelling and multinomial regression for relative risks (OR) with 95% confidence intervals (CI) were applied. Five trajectory groups (4.4-20.8%) showed stable occupational

groups and stable sustainable working life over time. Two trajectory groups had a decrease in sustainable working life: 6.1% were between being building and manufacturing worker, and mechanical manufacturing and transport worker, etc., and 8.7% were stable in occupations in administration and customer service clerks. One group (5.5%) had a stable sustainable working life but shifted from elementary occupations to occupations requiring an advanced higher education level. All studied factors played a role in belonging to the trajectory groups. To conclude, the concurrent changes over time in occupational groups and sustainable working life were stable. A few identified occupational groups had a decrease in sustainable working life over time, thus meriting support across working careers to remain in paid work.
Ropponen et al. 2025.
Industrial Health, vol. 63, no. 4.

Keywords: Cohort study; industry; longitudinal; occupation; sick leave; work.
Evidence Level: 4B
Link: https://pmc.ncbi.nlm.nih.gov/articles/PMC12307084/

III persons and capable workers: Constructing work ability in return-to-work negotiations after sickness absence

In return-to-work (RTW) negotiations after sickness absence, the work ability of an individual employee becomes a shared interest for the multiple stakeholders representing both the healthcare sector and working life. In practice, the employee, employer and occupational health professionals need to reach a shared understanding of the employee's work ability to enable shared decision-making concerning the plans for sustainable RTW. Drawing on 14 video-recorded RTW negotiations, we used conversation analysis-informed membership categorization analysis to examine how the participants of RTW negotiations discuss the work ability of an employee to pursue a shared understanding of the situation. Work ability was constructed in a very situational way, using illness categories to both explain the work ability of the employee and argue for or against their ability or inability to work. Our study contributes to research on RTW by introducing a new perspective to work ability. We show how work ability is realized during RTW negotiations through interaction, and how participants leverage their cultural understanding of illness and capability when negotiating work ability. We also demonstrate how membership categorization analysis can reveal the situational and consequential aspects of illness and work ability categories.
Keränen et al. 2025.
Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine, vol. 29, no. 4.

Keywords: Conversation analysis; membership categorization analysis; return-to-work; shared decision-making; work ability.
Evidence Level: 5B
Link: https://pubmed.ncbi.nlm.nih.gov/39397527/

Adapting to the Future of Work

Technology

Do occupational health and safety tools that utilize artificial intelligence have a measurable impact on worker injury or illness? Findings from a systematic review

Background: Artificial intelligence (AI) holds promise as a tool that can be used by practitioners in the field of occupational health and safety (OHS). This study aimed to identify AI applications specifically used for OHS and examine their impact on worker morbidity or mortality outcomes. **Methods:** We conducted a comprehensive systematic review. We searched six databases to identify published quantitative studies of OHS AI applications across the hierarchy of controls that were published between years 2018 to 2024. Title/abstract and full-text screening was conducted to identify eligible studies which were then assessed for quality and risk of bias and synthesized. **Results:** Of the 1255 articles identified by our search, only two

met eligibility criteria; one of which was appraised as medium quality and the other as low quality. The one medium quality study identified by our review was an AI-based chatbot health promotion tool which was shown to improve musculoskeletal symptoms. Our systematic review shows that we are at the early stages of understanding the role AI can play in OHS and it may be premature to recommend the wide-spread use of AI for health and safety practice within workplaces. **Conclusion:** There is a critical need for future research to unpack how considerations taken in the development and adoption of workplace AI tools for OHS can determine their effectiveness in addressing worker injury or illness.

Jetha et al. 2025.
Systematic Reviews, vol. 14, no. 1.

Keywords: Artificial intelligence; injury prevention; occupational health and safety practice; technological adoption.
Evidence Level: 1A
Link: https://systematicreviewsjournal.biomedcentral.com/articles/10.1186/s13643-025-02869-1