



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 January 2024 only.

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Description of Evidence Levels Definitions Used in this Review

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

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

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

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

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Enabling Healthy and Safe Workplaces

Health and Wellbeing

This month in Health and Wellbeing we explore the risk of obstructive sleep apnoea among health workers, the relationship between sleep and psychological well-being in soldiers, the immune status of quarry workers, obesity in steelworkers, employment practices, cost minimization, and their implications for seafarers' wellbeing, associations between workplace social capital and systolic blood pressure and the determinants of prevention intention in noisy industrial workplaces.

An assessment of the immune status of some stone quarry workers in Ondo state, Nigeria.

Background: Stone quarry activities in Nigeria are mostly unregulated such that the workers in these quarries are continuously exposed to the inhalation of silica dust. It has been observed that silica dust particles negatively impact the health of stone quarry workers which usually manifest as respiratory difficulties, asthma-like illnesses and other adventitious events of the lungs. **Methods:** The study was designed to evaluate the probable immunological impact of silica dust inhalation from stone crushing by workers. Blood samples were collected from consenting workers and analysed for total white blood cells and their subsets. Absolute CD4 cells numbers were also determined. **Results:** The results indicated that neutrophils and eosinophils numbers increased significantly ($P < .05$) and CD4 counts declined significantly ($P < .001$). Alteration in these proportions is a pointer to the injurious impact of silica dust on the immune system of these workers. **Conclusions:** The findings in this study should spur actions in the education of these workers on the need for the use of proper personal protection equipment and the establishment of a scheme to periodically carry out a health assessment check to identify those at most risk of developing chronic illnesses.

Onemu et al. 2024.

Medicine, vol. 103, no. 2.

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Keywords: Stone; quarry; immune status; Nigeria.

Evidence Level: 5B

Link: https://journals.lww.com/md-journal/fulltext/2024/01120/an_assessment_of_the_immune_status_of_some_stone.43.aspx

Risk of obstructive sleep apnoea among health workers: Results of a screening in a large Italian University Hospital.

Background: Obstructive sleep apnoea (OSA) is a common respiratory sleep disorder, related to increased mortality, poor quality of life, and higher risk of work accidents and injuries. Studies on the risk of OSA (rOSA) among health workers (HW) are scant. The aims of this study were to investigate this issue in a large University Hospital and to assess the effectiveness of a screening program. **Methods:** The STOP-BANG questionnaire (SBQ) was sent via e-mail to the 5031 HW employed at the University Hospital of Verona. HW who completed the SBQ were classified at low, moderate, and high rOSA. HW at high rOSA were invited to undergo nocturnal polygraphy. The determinants of rOSA were studied by non-parametric Kruskal-Wallis test, Pearson's chi-squared, and multinomial logistic model. **Results:** Of 5031 HW, 1564 (31.1%) completed the online questionnaire. Responders with low, moderate, and high rOSA were 72.7%, 13.7%, and 13.6%. Male gender, older age, and higher body mass index (BMI) were significant predictors of high rOSA, as expected. Physicians had the lowest probability of being in the high-risk category. Polygraphy was performed in 64 subjects. The positive predictive value of the self-administered SBQ was 68.8% (95%CI. 55.9-79.8%) but raised to 96.9% (95%CI. 89.2-99.6%) when re-administered by medical staff. **Conclusion:** SBQ showed its effectiveness as a screening tool in detecting undiagnosed OSA in HW. Systematic screening for OSA in work settings could allow early diagnosis and treatment, reducing short- and long-term health effects of OSA.

Spiteri et al. 2024.

International Archives of Occupational and Environmental Health, vol. 97, no. 1.

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Keywords: Healthcare workers; obstructive sleep apnea; occupational health; respiratory sleep disorders; STOP-BANG questionnaire.

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10791895/>

Risk factor analysis and risk prediction study of obesity in steelworkers: Model development based on an occupational health examination cohort dataset.

Background: Obesity is increasingly recognized as a grave public health concern globally. It is associated with prevalent diseases including coronary heart disease, fatty liver, type 2 diabetes, and dyslipidaemia. Prior research has identified demographic, socioeconomic, lifestyle, and genetic factors as contributors to obesity. Nevertheless, the influence of occupational risk factors on obesity among workers remains under-explored. Investigating risk factors specific to steelworkers is crucial for early detection, prediction, and effective intervention, thereby safeguarding their health. **Methods:** This research utilized a cohort study examining health impacts on workers in an iron and steel company in Hebei Province, China. The study involved 5469 participants. By univariate analysis, multifactor analysis, and review of relevant literature, predictor variables were found. Three predictive models-XG Boost, Support Vector Machine (SVM), and Random Forest (RF)-were employed. **Results:** Univariate analysis and cox proportional hazard regression modeling identified age, gender, smoking and drinking habits, dietary score, physical activity, shift work, exposure to high temperatures, occupational stress, and carbon monoxide exposure as key factors in the development of obesity in steelworkers. Test results indicated accuracies of 0.819, 0.868, and 0.872 for XG Boost, SVM, and RF respectively. Precision rates were 0.571, 0.696, and 0.765, while recall rates were 0.333, 0.592, and 0.481. The models achieved AUCs of 0.849, 0.908, and 0.912, with Brier scores of 0.128, 0.105, and 0.104, log losses of 0.409, 0.349, and 0.345, and calibration-in-the-large of 0.058, 0.054, and 0.051, respectively. Among these, the Random Forest model demonstrated superior performance. **Conclusions:** The research indicates that obesity in steelworkers results from a combination of occupational and lifestyle factors. Of the models tested, the Random Forest model exhibited superior predictive ability, highlighting its significant practical application.

Zhao et al. 2024.

Lipids in Health and Disease, vol. 23, no. 1.

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Keywords: Obesity; random forest; risk factor analysis; risk prediction; steelworkers.

Evidence Level: 4B

Link: <https://lipidworld.biomedcentral.com/articles/10.1186/s12944-023-01994-x>

Employment practices, cost minimization, and their implications for food provisions and seafarers' wellbeing on board ships: A qualitative analysis.

Background: The global shipping industry, responsible for delivering over 70% of the world's goods (in volume), has increasingly adopted cost minimization policies, contributing to precarious employment practices that adversely affect seafarers' wellbeing. **Methods:** This study focuses on the intricate relationship between employment precarity and food provision on cargo ships. By presenting seafarers' perspectives, we aim to understand how precarious employment practices and cost minimization in the industry influence power dynamics related to food and impact seafarers' wellbeing. Drawing on empirical data collected through shipboard observations and interviews with seafarers, this study examines the often-overlooked experiences and perspectives of seafarers. The research sheds light on the precarity of employment in shipping and its inherent impact on the provision of food on board and its implications for seafarers' physical and emotional health, including the availability of nutritious and sufficient food and its impact on their daily lives. **Results:** Through in-depth interviews, seafarers' insights into their experiences of food including the quality, availability, and cultural appropriateness of food on board are explored, as well as the standard of training for cooks. Through this research, we found substandard conditions on some of the ships, cost-focused decision-making, and lack of standardized food preparation practices on board. These findings underline the need for improved regulations, better training opportunities, and increased consideration for seafarers' wellbeing. These changes are essential to ensure the provision of

adequate and nutritious meals that promote the physical and mental health of seafarers on board ships. Specifically, the research underscores the need for policy and advocacy initiatives to improve seafarers' lives and promote fair working conditions in the global shipping industry. **Conclusions:** By amplifying the voices of seafarers and providing evidence-based insights, this study contributes to the larger discourse on workers' rights and the importance of decent working conditions. It calls for greater attention to the provision of adequate, nutritious, and culturally appropriate food on board cargo ships, recognizing its significance for seafarers' physical and mental wellbeing, as well as a call for standardized training for ship's cooks.

Baum-Talmor et al. 2024.

Inquiry: *The Journal of Health Care Organization, Provision, and Financing*, vol. 61.

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Keywords: Cost minimization; employment; food; power dynamics; precariousness; seafarers; shipping; wellbeing.

Evidence Level: 5B

Link: <https://journals.sagepub.com/doi/full/10.1177/00469580241229613>

Connection between sleep and psychological well-being in U.S. Army soldiers.

Background: The goal of this exploratory study was to examine the relationships between sleep consistency and workplace resilience among soldiers stationed in a challenging Arctic environment.

Methods: A total of 862 soldiers (67 females) on an Army base in Anchorage, AK, were provided WHOOP 3.0, a validated sleep biometric capture device and were surveyed at onboarding and at the conclusion of the study. Soldiers joined the study from early January to early March 2021 and completed the study in July 2021 (650 soldiers completed the onboarding survey and 210 completed the exit survey, with 151 soldiers completing both). Three comparative analyses were conducted. First, soldiers' sleep and cardiac metrics were compared against the general WHOOP population and a WHOOP sample living in AK. Second, seasonal trends (summer versus winter) in soldiers' sleep metrics (time in bed, hours of sleep, wake duration during sleep, time of sleep onset/offset, and disturbances) were analyzed, and these seasonal trends were compared with the general WHOOP population and the WHOOP sample living in AK. Third, soldiers' exertion, sleep duration, and sleep consistency were correlated with their self-reported psychological functioning. All analyses were conducted with parametric and non-parametric statistics. This study was approved by The University of Queensland Human Research Ethics Committee (Brisbane, Australia) Institutional Review Board. **Results:** Because of the exploratory nature of the study, the critical significance value was set at $P < .001$. Results revealed that: (1) Arctic soldiers had poorer sleep consistency and sleep duration than the general WHOOP sample and the Alaskan WHOOP sample, (2) Arctic soldiers showed a decrease in sleep consistency and sleep duration in the summer compared to that in the winter, (3) Arctic soldiers were less able to control their bedroom environment in the summer than in the winter, and (4) sleep consistency but not sleep duration correlated positively with self-report measures of workplace resilience and healthy social networks and negatively with homesickness.

Conclusions: The study highlights the relationship between seasonality, sleep consistency, and psychological well-being. The results indicate the potential importance of sleep consistency in psychological functioning, suggesting that future work should manipulate factors known to increase sleep consistency to assess whether improved sleep consistency can enhance the well-being of soldiers. Such efforts would be of particular value in an Arctic environment, where seasonality effects are large and sleep consistency is difficult to maintain.

Holmes et al. 2024.

Military Medicine, vol. 189, no. 1-2.

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Keywords: Sleep; psychological well-being; US Army.

Evidence Level: 5B

Link: <https://academic.oup.com/milmed/article/189/1-2/e40/7189626?login=true>

Association between workplace social capital and systolic blood pressure among 23 173 workers at 367 small-sized and medium-sized enterprises in Japan: A cross-sectional study.

Background: Social capital (SC) has been shown to be inversely associated with elevated blood pressure. While SC in the workplace may also be associated with blood pressure, it has not been extensively studied. We aimed to investigate the association between workplace SC and systolic blood pressure (SBP).

Methods: Design: A cross-sectional study. Setting: 367 small-sized and medium-sized companies in Japan. Participants: A total of 23 173 participants (15 991 males and 7182 females) aged ≥ 18 years. Exposure of interest: SC was assessed using individual responses to eight 4-point Likert questions used in the Brief Job Stress Questionnaire. Workplace SC was assessed as the mean of individual-level responses to the SC questions from those working in the same company. Outcome measure: Systolic blood pressure (SBP)

Results: A multilevel linear regression model revealed that higher workplace-level SC was linked with lower SBP (coef. $=-0.53$ per 1SD increment in workplace SC, 95% CI $=-1.02$ to -0.05) among females in the age-adjusted model, which remained statistically significant after adjusting for other covariates. After adjusting for individual-level SC, this association was attenuated and became non-significant (coef. $=-0.41$, 95% CI $=-0.87$ to 0.05), while individual-level SC was inversely associated with SBP (coef. $=-0.43$, 95% CI $=-0.73$ to -0.13). Among males, we did not find any evidence of significant inverse associations either in relation to workplace SC (coef. $=-0.12$, 95% CI $=-0.46$ to 0.21) or individual-level SC (coef. $=0.19$, 95% CI $=-0.01$ to 0.39). **Conclusions:** Our study findings suggested that workplace-level SC can affect SBP differently by sex.

Inoue et al. 2024.

BMJ Open, vol. 14, no. 1.

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Keywords: Blood pressure; epidemiologic studies; epidemiology; social medicine.

Evidence Level: 4B

Link: <https://bmjopen.bmj.com/content/14/1/e074125.long>

The sound of safety: Exploring the determinants of prevention intention in noisy industrial workplaces.

Background: Occupational noise exposure is a pervasive issue in many industries, leading to a range of health issues and sleep disturbances among workers. Additionally, there is a strong desire among these workers to prevent industrial accidents. **Methods:** This study, aimed at enhancing worker health and well-being, utilized a survey distributed by the Korean Confederation of Trade Unions to field workers. Data from 1285 workers were collected and analyzed using partial least squares structural equation modeling (PLS-SEM) to identify and understand the factors affecting prevention intention in noisy work environments. **Results:** Our findings indicate that health problems resulting from occupational noise exposure significantly influence insomnia, perceived severity of potential accidents, perceived benefits of preventive measures, and perceived barriers. Perceived severity was significantly correlated with prevention intention, emphasizing the role of risk perception in motivating preventive behaviors. Perceived benefits were also significantly associated with prevention intention, highlighting the importance of positive outcomes in influencing workers' behaviors. Additionally, perceived barriers showed a significant relationship with prevention intention, suggesting that overcoming these barriers is crucial in promoting preventive behaviors. Demographic factors such as gender displayed a significant association with prevention intention, while age did not. **Conclusions:** This study provides valuable insights into the multifaceted factors influencing workers' intention to prevent industrial accidents in noisy environments, underlining the importance of comprehensive data collection tools in understanding these dynamics.

Jo et al. 2024.

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

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Keywords: Health belief model; insomnia; noise-induced hearing loss; perceived barriers; preventive behavior.

Evidence Level: 4B

Link: <https://bmcpublikealth.biomedcentral.com/articles/10.1186/s12889-023-17618-z>

Work Health and Safety

This month in Work Health and Safety we explore work health and safety issues associated with Mpox vaccine acceptance among healthcare worker, occupational variation in incidence of oropharyngeal cancer, associations between outdoor visible greenness at the workplace and metabolic syndrome, hand hygiene messaging design in the workplace, and the willingness to accept metaverse safety training in construction workers.

Mpox vaccine acceptance among healthcare workers: A systematic review and meta-analysis.

Background: Mpox is a zoonotic viral disease that emerged in May 2022 and has since shown a high prevalence in non-mpox-endemic areas, resulting in an outbreak that caused more than 84,000 cases in 110 countries around the globe. Several vaccines are available to prevent the disease, and multiple studies have been conducted to assess the attitudes of different populations toward receiving the mpox vaccine. This study systematically reviews all the studies conducted on mpox vaccine acceptance/hesitancy among healthcare workers. **Methods:** A systematic literature search was conducted through four electronic databases, including PubMed, Scopus, Web of Science, and Google Scholar, up to March 2024. Studies that described mpox vaccine acceptance/hesitancy among healthcare workers were included, and the data were extracted using a uniform extraction sheet. Following the extraction, the meta-analysis included ten studies with 7322 healthcare workers. Three researchers independently assessed the risk of bias in the included study using the Newcastle-Ottawa Scale (NOS). **Results:** Ten studies were included in the review. This review indicates that the prevalence of mpox vaccine acceptance was 58.5%, and the prevalence of mpox vaccine hesitancy was 41.5%. There was a higher prevalence of acceptance in countries located in Asian and African areas compared to those in North America and Europe, estimated at 68% and 44.3%, respectively. Among the studies conducted solely among physicians, there was a high prevalence of mpox vaccine acceptance, at 77.1%, compared to 49% in studies that included all healthcare workers. **Conclusion:** There is a significant variation in the prevalence of mpox vaccine acceptance among different populations. Further research is needed to identify the factors that contribute to this variation and to develop interventions to increase vaccine acceptance. In addition, it is important to promote research on mpox vaccine acceptance and hesitancy among healthcare workers in countries where data is limited. This research will help policymakers develop effective policies to increase acceptance and reduce the disease burden.

Mektebi et al. 2024.

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

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Keywords: Healthcare workers; meta-analysis; mpox; vaccine; vaccine acceptance; vaccine hesitancy.

Evidence Level: 1A

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-17186-2>

Occupational variation in incidence of oropharyngeal cancer in the Nordic countries.

Background: Evaluate the occupational variation in incidence of oropharyngeal cancer (OPC).

Methods: We calculated standardized incidence ratios (SIRs) of OPC in occupational categories in the Nordic countries relative to the entire national populations. The data covered 6155 OPC cases.

Results: Among men high risk of OPC was observed, among else, in waiters (SIR 6.28, 95% CI 4.68-8.26), beverage workers (SIR 3.00, 95% CI 1.72-4.88), and artistic workers (SIR 2.97, 95% CI 2.31-3.76). Among women high risk of OPC was observed in waiters (SIR 2.02, 95% CI 1.41-2.81) and packers (SIR 1.73, 95% CI 1.07-2.64). The lowest SIRs were observed in female gardeners (SIR 0.27, 95% CI 0.12-0.51) and male farmers (SIR 0.30, 95% CI 0.25-0.35). **Conclusion:** The 20-fold variation in incidence of OPC between occupations needs further investigation in studies with detailed information on occupational and non-occupational risk factors.

Nikkilä et al. 2024.

European Archives of Oto-Rhino-Laryngology, vol. 281, no. 1.

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Keywords: Head and neck cancer; OPC; occupational risk; oropharyngeal cancer; oropharynx.

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10764423/>

Beneficial associations between outdoor visible greenness at the workplace and metabolic syndrome in Chinese adults.

Background: Greenness surrounding residential places has been found to significantly reduce the risk of diseases such as hypertension, obesity, and metabolic syndrome (MetS). However, it is unclear whether visible greenness exposure at the workplace has any impact on the risk of MetS. **Methods:** Visible greenness exposure was assessed using a Green View Index (GVI) based on street view images through a convolutional neural network model. We utilized logistic regression to examine the cross-sectional association between GVI and MetS as well as its components among 51,552 adults aged 18-60 in the city of Hangzhou, China, from January 2018 to December 2021. Stratified analyses were conducted by age and sex groups. Furthermore, a scenario analysis was conducted to investigate the risks of having MetS among adults in different GVI scenarios. **Results:** The mean age of the participants was 40.1, and 38.5% were women. We found a statistically significant association between GVI and having MetS. Compared to the lowest quartile of GVI, participants in the highest quartile of GVI had a 17% (95% CI: 11-23%) lower odds of having MetS. The protective association was stronger in the males, but we did not observe such differences in different age groups. Furthermore, we found inverse associations between GVI and the odds of hypertension, low high-density lipoprotein cholesterol, obesity, and high levels of FPG.

Conclusions: Higher exposure to outdoor visible greenness in the workplace environment might have a protective effect against MetS.

Pan et al. 2024.

Environmental International, vol. 183.

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Keywords: Association; GVI; green space; greenery; greenness; metabolic syndrome; risk; street view; workplace.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S0160412024006001?via%3Dihub>

Hand hygiene messaging design in the workplace: Views from the workforce-introduction.

Background. The study aimed to (1) discover workers' attitudes toward the use of novel video screens to improve hand sanitization in the workplace and (2) discover what workers' preferences are for hand hygiene (HH) messaging style and tone and reasons for their preferences. **Background:** Practicing good HH in non-medical office settings is vital to curb the spread of a range of common and infectious diseases. Despite this, workers are rarely consulting in the construction of HH messages. The qualitative views of users can provide us with the "why" rather than the "what" and can highlight areas of cynicism, concern and overall attitudes to HH. **Methods:** A survey was completed by 520 UK workers concerning attitudes and views toward HH messaging and the use of a video-based hand sanitizer unit. Analysis consisted of both qualitative and quantitative methods. **Results:** Workers were sceptical toward the use of digital technologies within HH interventions, and there were misgivings about the role that video could play. Results demonstrated a strong preference for positive and supportive messages. Educational and trustworthy qualities were well rated. Messages that emphasized surveillance, previously successful in a clinical setting, or guilt, were not well received. Visual approaches that utilized serious illustration were valued. **Conclusion:** This study highlights how consulting workers before the design of HH initiatives is important in guiding the design process. The resultant user-centred criteria promotes the use of positive, motivational, thought-provoking, surprising, and visual approaches to HH messaging.

Stones et al. 2024.

HERD, vol. 17, no. 1.

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Keywords: Communication; graphic design; handwashing; participatory design; research-informed design.

Evidence Level: 4B

Link: <https://journals.sagepub.com/doi/full/10.1177/19375867231195646>

Willingness to accept metaverse safety training for construction workers based on extended UTAUT.

Background: Safety training (ST) is essential in avoiding unsafe behavior of construction workers. With the rise of metaverse technology, metaverse safety training (MST) has gradually become a new model to guide construction workers in safety production. **Methods:** An in-depth study of construction workers' willingness to accept the metaverse safety training (WAMST) helps improve its effectiveness, but studies need to pay more attention to it. This study constructs a conceptual model of WAMST for construction workers, and the influencing factors of WAMST are explained based on the extended Unified Theory of Acceptance and Use of Technology (UTAUT). It established a Structural equation modeling to verify the relationship between influencing factors. An example verifies the feasibility of the model. **Results:** The results show that the framework significantly contributes to the willingness of construction workers to participate and improves safety awareness. Specifically, performance expectancy, effort expectancy, social influence, and convenient conditions significantly affect the construction workers' willingness to accept. Convenient conditions have a direct effect on actual behavior. Willingness to accept plays a mediating role between performance expectancy and actual behavior. **Conclusions:** Perceived trust moderates the effect between willingness to accept and actual behavior, and the force of positive interpretation increases proportionally. It confirms how to improve the safety capacity of construction workers and provides references for governments, enterprises, and projects to formulate ST strategies.

Guo et al. 2024.

Frontiers in Public Health, vol. 11.

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Keywords: Construction worker; metaverse; safety training; structural equation modeling; unified theory of acceptance and use of technology.

Evidence Level: 6B

Link: <https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1294203/full>

Chronic Health Issues

This month in Chronic Health Issues we explore the impact of cardiorespiratory fitness and physical workload on disability pension, the impairment in work and activities of daily life in patients with psoriasis and the clinical characteristics of systemic sclerosis patients with occupational silicosis.

The impact of cardiorespiratory fitness and physical workload on disability pension-a cohort study of Swedish men.

Background: Understanding the impact of physical capacity in combination with high physical workload could be beneficial for the prevention of health-related exits from work. Therefore, the aim of this study was to investigate the separate and combined effects of low cardiorespiratory fitness and high physical workload on disability pension (DP) due to any cause, musculoskeletal disorders (MSD), and cardiovascular diseases (CVD). **Methods:** A total of 279 353 men born between 1951 and 1961 were followed regarding DP between 2006 and 2020, ages 45-64. Cardiorespiratory fitness was assessed during military conscription, using an ergometer bicycle test. Physical workload was based on a job-exposure matrix (JEM) linked to occupational title in 2005. Cox regression models estimated separate and combined associations with DP. **Results:** Low cardiorespiratory fitness and high physical workload were associated with increased risk of DP. For all cause DP, the fully adjusted hazard ratio and 95% confidence interval for those with low cardiorespiratory fitness was 1.38 (1.32-1.46) and for those with high physical workload 1.48 (1.39-1.57). For all cause and MSD DP, but not for CVD DP, the combination of low cardiorespiratory fitness and high physical workload resulted in higher risks than when adding the effect of the single exposures. **Conclusion:** Both low cardiorespiratory fitness in youth and later exposure to high physical workload were associated with an increased risk of DP, where workers with the combination of

both low cardiorespiratory fitness and a high physical workload had the highest risks (all-cause and MSD DP).

Berglund et al. 2024.

International Archives of Occupational and Environmental Health, vol. 97, no. 1.

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Keywords: Cardiovascular disease; epidemiology; ergonomics; job-exposure matrix; musculoskeletal disorders; physical capacity.

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10791704/>

Impairment in work and activities of daily life in patients with psoriasis: Results of the prospective BioCAPTURE registry.

Background: Little is known about the extent of impairments in work and activities of daily life (ADL) in patients with psoriasis, and the influence of contextual factors such as disease-related characteristics and treatment. Therefore, this study aimed to assess these impairments in patients with psoriasis who started using biologicals/small molecule inhibitors. **Methods:** Using data from the prospective BioCAPTURE registry, we collected patient, disease, and treatment parameters, as well as work/ADL impairments at baseline, 6 and 12 months. Changes in impairment parameters and correlations between impairment and patient/disease characteristics were assessed using generalized estimating equations. **Results:** We included 194 patients in our analysis. After biological initiation, disease activity decreased significantly (PASI 11.2 at baseline versus 3.9 at 12 months, $p < 0.001$). Work-for-pay in this cohort was lower than in the Dutch general population (53% versus 67%, $p = 0.01$). In patients who had work-for-pay, presenteeism improved over time (5% at baseline versus 0% at 12 months, $p = 0.04$). Up to half of the patients reported impairments in ADL, which did not change over time. Associations between impairments and contextual factors varied, but all impairments were associated with worse mental/physical general functioning. **Conclusion:** Patients with psoriasis using biologicals are less likely to have work-for-pay. Treatment improves the work productivity of employed patients, but we were unable to detect changes in ADL performance.

van Hal et al. 2024.

Journal of Dermatological Treatment, vol. 35, no. 1.

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Keywords: Psoriasis; activities of daily living; work.

Evidence Level: 4B

Link: <https://www.tandfonline.com/doi/full/10.1080/09546634.2024.2304025>

Clinical characteristics of systemic sclerosis patients with occupational silicosis.

Background: To explore the clinical characteristics of systemic sclerosis complicated with silicosis.

Methods: The systemic sclerosis patients treated in the Guangxi Workers' Hospital and the People's Hospital of Guangxi Zhuang Autonomous Region from January 2000 to December 2020 were divided into the systemic sclerosis with silicosis group and the systemic sclerosis without silicosis group. Survival analysis was performed using Kaplan-Meier estimates the Cox proportional hazards model. A propensity score matching was applied in order to avoid the selection bias. **Results:** Over the past 20 years, 72 systemic sclerosis patients with silicosis and 238 systemic sclerosis patients without silicosis were treated in the two hospitals. The systemic sclerosis patients with silicosis group had more males ($P < 0.000$), lower mean age at onset of SSc ($P < 0.000$), more frequent occurrence of weight loss ($P = 0.028$), smoking ($P < 0.000$), tuberculosis ($P < 0.000$), cardiac involvement ($P < 0.000$), ILD ($P = 0.017$), pulmonary hypertension ($P = 0.024$), elevated BNP ($P < 0.000$). With regards to the multivariate Cox regression analysis, silicosis was related with a higher overall mortality before (HR = 3.666, 95% CI = 1.440-11.234, $p = 0.025$) and after the propensity score matching analysis (HR = 2.817, 95% CI = 1.196-10.764, $p = 0.014$). Independent risk factors for overall mortality were Gangrene (HR = 3.003, 95% CI = 1.343-9.431), Cardiac involved (HR = 5.370, 95% CI = 1.910-15.472), Scl-70 (HR = 3.569, 95% CI = 1.333-10.869), Elevated BNP (HR = 2.135, 95% CI = 1.293-9.564). Concomitant silicosis worsens systemic sclerosis patients' prognoses. Gangrene, Scl-70,

elevated BNP and cardiac involvement are independent risk factors for overall mortality. **Conclusions:** Key Points •Concomitant silicosis worsens SSc patients' prognoses. •For individuals with occupational exposure, close observation of the symptoms of SSc, early diagnosis, and interruption of exposure may improve the prognosis. •Gangrene, Scl-70, elevated BNP and cardiac involvement are independent risk factors for overall mortality.

Huo et al. 2024.

Clinical Rheumatology, vol. 43, no. 1.

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Keywords: Cardiac involvement; propensity score matching; silicosis; systemic sclerosis.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10774212/>

Occupational Exposure

This month in Occupational Exposure we explore issues associated with exposure to airborne mycotoxins, gaseous PAHs during controlled forest fires, pesticides and its effects on serum concentrations of PFAS and systemic cortisol levels, microorganisms, endotoxin, hydrogen sulfide, and dust during work at drilling waste treatment plants. We also explore occupational exposure to radiofrequency electromagnetic fields, solar, heat and noise. Studies also explored the relationship between parental occupations at birth and risk of adult testicular germ cell tumors in offspring and the risks associated with Brucella vaccine exposure.

Exposure to airborne mycotoxins: The riskiest working environments and tasks

Background: There is growing interest in the role of airborne mycotoxins in occupational environments, however, their impact on human health still remains poorly investigated. This review aims to provide a comprehensive analysis of the existing literature on the occurrence of inhalable mycotoxins in working environments to investigate which sectors and tasks are at greater risk of exposure. **Methods:** We have performed a systematic search in the PubMed, Scopus and Web of Science databases from 2010 to date, without limitation of geographic location. **Results:** Database searches yielded 350 articles. After the removal of duplicates and applying our inclusion and exclusion criteria, 31 papers remained. Results show that the most exposed workers are those engaged in activities related to animal care and management and, in particular, in feeding tasks, while harvester cleaning seems to be the activity with the highest levels of exposure in agriculture. In healthcare settings mycotoxin concentrations are low but HVAC systems can be a source of contamination and this reinforces the relevance of further studies in this sector. The most common scenario is the exposure to multiple mycotoxins with variable concentrations depending on the working environment, the products handled or the tasks performed by workers. Some authors emphasize the importance of multi-approach sampling and analysis protocols to achieve an accurate and more realistic risk characterization. **Conclusions:** Results brought forward by this review can be utilized by health and safety professionals to recognize activities in which workers may be potentially exposed to airborne mycotoxins and thus undertake suitable preventive and protective measures.

Marcelloni et al. 2024.

Annals of Work Exposures and Health, vol. 68, no. 1.

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Keywords: Inhalation; molds; mycotoxin; occupational exposure; risk assessment; toxicity; working task.
Evidence Level: 1A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10773202/>

The effects of radiofrequency electromagnetic fields exposure on tinnitus, migraine and non-specific symptoms in the general and working population: A systematic review and meta-analysis on human observational studies.

Background: Applications emitting radiofrequency electromagnetic fields (RF-EMF; 100 kHz to 300 GHz) are widely used for communication (e.g. mobile phones), in medicine (diathermy) and in industry (RF heaters). Objectives: The objective is to systematically review the effects of longer-term or repeated local and whole human body radiofrequency electromagnetic field (RF-EMF) exposure on the occurrence of symptoms. Primary hypotheses were tinnitus, migraine and headaches in relation to RF-EMF exposure of the brain, sleep disturbances and composite symptom scores in relation to whole-body RF-EMF exposure.

Methods: Eligibility criteria: We included case-control and prospective cohort studies in the general population or workers estimating local or whole-body RF-EMF exposure for at least one week.

Information sources: We conducted a systematic literature search in various databases including Web of Science and Medline. Risk of bias: We used the Risk of Bias (RoB) tool developed by OHAT adapted to the topic of this review. Synthesis of results: We synthesized studies using random effects meta-analysis.

Results: Included studies: We included 13 papers from eight distinct cohort and one case-control studies with a total of 486,558 participants conducted exclusively in Europe. Tinnitus is addressed in three papers, migraine in one, headaches in six, sleep disturbances in five, and composite symptom scores in five papers. Only one study addressed occupational exposure. Synthesis of results: For all five priority hypotheses, available research suggests that RF-EMF exposure below guideline values does not cause symptoms, but the evidence is very uncertain. The very low certainty evidence is due the low number of studies, possible risk of bias in some studies, inconsistencies, indirectness, and imprecision. In terms of non-priority hypotheses numerous exposure-outcome combinations were addressed in the 13 eligible papers without indication for an association related to a specific symptom or exposure source.

Discussion: Limitations of evidence: This review topic includes various challenges related to confounding control and exposure assessment. Many of these aspects are inherently present and not easy to be solved in future research. Since near-field exposure from wireless communication devices is related to lifestyle, a particular challenge is to differentiate between potential biophysical effects and other potential effects from extensive use of wireless communication devices that may compete with healthy behaviour such as sleeping or physical activity. Future research needs novel and innovative methods to differentiate between these two hypothetical mechanisms. **Conclusion:** Interpretation: This is currently the best available evidence to underpin safety of RF-EMF. There is no indication that RF-EMF below guideline values causes symptoms. However, inherent limitations of the research results in substantial uncertainty.

Other: Funding: This review was partially funded by the WHO radioprotection programme.

Registration: The protocol for this review has been registered in Prospero (reg no CRD42021239432) and published in Environment International (Röösli et al., 2021).

Röösli et al. 2024.

Environment International, vol. 183.

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Keywords: Radiofrequency electromagnetic fields; tinnitus; migraine.

Evidence Level: 1A

Link: <https://www.sciencedirect.com/science/article/pii/S0160412024006116?via%3Dihub>

Implication of noise exposure on hearing with emphasis to hOGG1 and GPx-1 polymorphisms and HO-1 protein among textile workers.

Background: Noise exposure is a health hazard in the textile industry. In cochlear hair cells, DNA damage caused by 8-oxoguanine (8-oxo G) can result in noise-induced hearing loss. Human 8-hydroxyguanine glycosylase (hOGG1) is a DNA repair enzyme that excises (8-oxo G) in the DNA and repairs DNA damage. Glutathione peroxidase-1 (GPx) is a crucial antioxidant enzyme that aids in limiting cochlear damages. Heme oxygenase-1 (HO-1) is a stress-inducible protein with a high fold change in the hair cells of the cochlea. **Methods:** The study aimed to investigate the association of either hOGG1 and GPx-1 polymorphisms with audiometric notches and HO-1 protein among textile workers. hOGG1 and GPx genotypes were analyzed by PCR-RFLP, and HO-1 levels were measured by ELISA in 115 male textile workers. Blood pressure and audiogram were performed. Results recorded the relation between

audiometric notches and ear complaints among workers. **Results:** Older age workers showed audiometric notches at > 25 dB with a significant decrease in HO-1 levels and higher levels in workers with normal audiogram. Ser/Cys genotype of hOGG1 gene was associated with age and work duration while CC genotype of GPx is associated with HO-1 levels and diastolic pressure. Ser/Cys genotype of hOGG1 gene was associated with age while Cys/Cys genotype was associated with work duration among workers. CC genotype of GPx gene was associated with higher HO-1 levels and TT genotype was associated with high diastolic pressure. **Conclusions:** Finally, hearing impairment was dependent on the duration of exposure to noise, older age, and the presence of heterozygote TC genotype of GPx gene among textile workers.

Taha et al. 2024.

Environmental Science and Pollution Research International, vol. 31, no. 4.

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Keywords: Audiometric notches; GPx genes; HO-1 protein; Hearing impairment; Noise; hOGG1.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10798917/>

Firefighters' personal exposure to gaseous PAHs during controlled forest fires: A case study with estimation of respiratory health risks and in vitro toxicity.

Background: Firefighters are daily exposed to adverse health-hazardous pollutants. Polycyclic aromatic hydrocarbons (PAHs), well known endocrine disruptors with carcinogenic, mutagenic, and teratogenic properties, are among the most relevant pollutants. The characterization of firefighters' occupational exposure to airborne PAHs remains limited; information is scarce for European firefighters. Also, the in vitro assessment of firefighters' respiratory health risks is inexistent. **Methods:** To reply to these scientific gaps, this work characterizes the levels of gaseous PAH in firefighters' personal air during regular working activities at controlled forest fires and at fire stations (control group). **Results:** Breathable levels were 2.2-26.7 times higher during fire events than in the control group (2.63-32.63 $\mu\text{g}/\text{m}^3$ versus 1.22 $\mu\text{g}/\text{m}^3$, $p < 0.001$); the available occupational guidelines (100 and 200 $\mu\text{g}/\text{m}^3$ defined by the US National Institute for Occupational Safety and Health and the North American Occupational Safety and Health Administration, respectively) were not exceeded. Concentrations of (possible/probable) carcinogenic PAHs were 1.9-15.3 times superior during firefighting ($p < 0.001$). Increased values of total benzo(a)pyrene equivalents ($p = 0.101$), dose rates ($p < 0.001$), and carcinogenic risks ($p = 0.063$) were estimated in firefighters during controlled fires comparatively with the control group. Firefighters' breathable gaseous phase collected during fire events contributed to induce a significant viability decrease (<70 %; $p < 0.05$) in A549 and Calu-3 cell lines. The principal component analysis (PCA) allowed the differentiation between firefighters participating in controlled fire events from the control group. PCA analysis demonstrated the potential of PAHs to distinguish different sources of firefighters' occupational exposure and of combining estimated health risk parameters with in vitro toxicities determined with human-breathable air collected during real-life scenarios. Overall, the participation in controlled fire events contributes to the respiratory health burden of firefighting forces. **Conclusions:** However, more studies are needed to corroborate these preliminary findings, explore the respiratory toxicological mechanisms, and support the implementation of preventive actions and mitigation strategies to pursue firefighters' health.

Teixeira et al. 2024.

Science of The Total Environment, vol. 908.

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Keywords: Airborne PAHs; controlled fires; firefighting forces; health risk assessment; occupational exposure; pulmonary cell viability assays.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0048969723069929?via%3Dihub>

What risk do Brucella vaccines pose to humans? A systematic review of the scientific literature on occupational exposure.

Background: Currently, vaccination of livestock with attenuated strains of Brucella remains an essential measure for controlling brucellosis, although these vaccines may be dangerous to humans. The aim of this study was to review the risk posed to humans by occupational exposure to vaccine strains and the

measures that should be implemented to minimize this risk. **Methods:** This article reviewed the scientific literature indexed in PubMed up to September 30, 2024, following "the PRISMA guidelines". Special emphasis was placed on the vaccine strain used and the route of exposure. Non-occupational exposure to vaccine strains, intentional human inoculation, publications on exposure to wild strains, and secondary scientific sources were excluded from the study. **Results:** Nineteen primary reports were found and classified in three subgroups: safety accidents in vaccine factories that led to an outbreak (n = 2), surveillance studies on vaccine manufacturing workers with a serologic diagnosis of Brucella infection (n = 3), and publications of infection by vaccine strains during their administration, including case reports, records of occupational accidents and investigations of outbreaks in vaccination campaigns (n = 14). Although accidental exposure during vaccine manufacturing were uncommon, they could provoke large outbreaks through airborne spread with risk of spread to the neighbouring population. Besides, despite strict protection measures, a percentage of vaccine manufacturing workers developed positive Brucella serology without clinical infection. The most frequent type of exposure with symptomatic infection was needle injury during vaccine administration. Prolonged contact with the pathogen, lack of information and a low adherence to personal protective equipment (PPE) use in the work environment were commonly associated with infection. **Conclusions:** Brucella vaccines pose occupational risk of contagion to humans from their production to their administration to livestock, although morbidity is low and deaths were not reported. Recommended protective measures and active surveillance of exposed workers appeared to reduce this risk. It would be advisable to carry out observational studies and/or systematic registries using solid diagnostic criteria.

Vives-Soto et al. 2024.

PLoS Neglected Tropical Diseases, vol. 18, no. 1.

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Keywords: Vaccines; environmental exposure; Brucella.

Evidence Level: 1A

Link: <https://journals.plos.org/plosntds/article?id=10.1371/journal.pntd.0011889>

Occupational solar exposure and basal cell carcinoma. A review of the epidemiologic literature with meta-analysis focusing on particular methodological aspects.

Background: Numerous epidemiologic studies and a few systematic reviews have investigated the association between occupational solar exposure and basal cell carcinoma (BCC). However, previous reviews have several deficits with regard to included and excluded studies/risk estimates and the assessment of risk of selection bias (RoSB). Our aim was to review epidemiologic studies with a focus on these deficits and to use meta-(regression) analyses to summarize risk estimates. **Methods:** We systematically searched PubMed (including MEDLINE) and Embase for epidemiologic studies. Study evaluation considered four main aspects of risk of bias assessments, i.e. Selection of subjects (selection bias); Exposure variables; Outcome variables; Data analysis. **Results:** Of 56 identified references, 32 were used for meta-(regression) analyses. The overall pooled risk estimate for BCC comparing high/present vs. low/absent occupational solar exposure was 1.20 (95% CI 1.02-1.43); among studies without major deficits regarding data analysis, it was 1.10 (95% CI 0.91-1.33). Studies with low and high RoSB had pooled risk estimates of 0.83 (95% CI 0.73-0.93) and 1.95 (95% CI 1.42-2.67), respectively. The definitions of exposure and outcome variables were not correlated with study risk estimates. Studies with low RoSB in populations with the same latitude or lower than Germany had a pooled risk estimate of 1.01 (95% CI 0.88-1.15).

Conclusion: Due to the different associations between occupational solar exposure and BCC among studies with low and high RoSB, we reason that the current epidemiologic evidence base does not permit the conclusion that regular outdoor workers have an increased risk of BCC.

Wendt et al. 2024.

European Journal of Epidemiology, vol. 39, no. 1.

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Keywords: Basal cell carcinoma; meta-analysis; occupational exposure; review; ultraviolet Radiation.

Evidence Level: 1A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10810945/>

Effects of heat and personal protective equipment on thermal strain in healthcare workers: Part B- application of wearable sensors to observe heat strain among healthcare workers under controlled conditions.

Background. As climate change accelerates, healthcare workers (HCW) are expected to be more frequently exposed to heat at work. Heat stress can be exacerbated by physical activity and unfavorable working requirements, such as wearing personal protective equipment (PPE). Thus, understanding its potential negative effects on HCW's health and working performance is becoming crucial. Using wearable sensors, this study investigated the physiological effects of heat stress due to HCW-related activities.

Methods: Eighteen participants performed four experimental sessions in a controlled climatic environment following a standardized protocol. The conditions were (a) 22 °C, (b) 22 °C and PPE, (c) 27 °C and (d) 27 °C and PPE. An ear sensor (body temperature, heart rate) and a skin sensor (skin temperature) were used to record the participants' physiological parameters. **Results:** Heat and PPE had a significant effect on the measured physiological parameters. When wearing PPE, the median participants' body temperature was 0.1 °C higher compared to not wearing PPE. At 27 °C, the median body temperature was 0.5 °C higher than at 22 °C. For median skin temperature, wearing PPE resulted in a 0.4 °C increase and higher temperatures in a 1.0 °C increase. An increase in median heart rate was also observed for PPE (+ 2/min) and heat (+ 3/min). **Conclusion:** Long-term health and productivity risks can be further aggravated by the predicted temperature rise due to climate change. Further physiological studies with a well-designed intervention are needed to strengthen the evidence for developing comprehensive policies to protect workers in the healthcare sector.

Wibowo et al. 2024.

International Archives of Occupational and Environmental Health, vol. 97, no. 1.

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Keywords: Climate change; healthcare worker; heat stress; personal protective equipment; physiological effects; wearables.

Evidence Level: 3B

Link: <https://link.springer.com/article/10.1007/s00420-023-02022-2>

Parental occupations at birth and risk of adult testicular germ cell tumours in offspring: A French nationwide case-control study.

Background: Testicular germ cell tumours (TGCT) are the most frequent cancer in young men in developed countries. Parental occupational exposures during early-life periods are suspected to increase TGCT risk. The objective was to estimate the association between parental occupations at birth and adult TGCT. **Methods:** A case-control study was conducted, including 454 TGCT cases aged 18-45 from 20 French university hospitals, matched to 670 controls based on region and year of birth. Data collected from participants included parental jobs at birth coded according to the International Standard Classification of Occupation-1968 and the French nomenclature of activities-1999. Odds ratios (OR) for TGCT and 95% confidence intervals (CI) were estimated using conditional logistic regression, adjusting for TGCT risk factors. **Results:** Paternal jobs at birth as service workers (OR = 1.98, CI 1.18-3.30), protective service workers (OR = 2.40, CI 1.20-4.81), transport equipment operators (OR = 1.96, CI 1.14-3.37), specialized farmers (OR = 2.66, CI 1.03-6.90), and maternal jobs as secondary education teachers (OR = 2.27, CI 1.09-4.76) or in secondary education (OR = 2.35, CI 1.13-4.88) were significantly associated with adult TGCT. The risk of seminoma was increased for the above-mentioned paternal jobs and that of non-seminomas for public administration and defence; compulsory social security (OR = 1.99, CI 1.09-3.65); general, economic, and social administration (OR = 3.21, CI 1.23-8.39) for fathers; and secondary education teacher (OR = 4.67, CI 1.87-11.67) and secondary education (OR = 3.50, CI 1.36-9.01) for mothers. **Conclusion:** Some paternal jobs, such as service workers, transport equipment operators, or specialized farmers, and maternal jobs in secondary education seem to be associated with an increased risk of TGCT with specific features depending on the histological type. These data allow hypotheses to be put forward for further studies as to the involvement of occupational exposures in the risk of developing TGCT, such as exposure to pesticides, solvents, or heavy metals.

Paul et al. 2024.

Frontiers in Public Health, vol. 16.

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Keywords: Parental job; parental occupation; parental occupational exposure; prenatal exposure; testicular cancer; testicular germ cell tumor.

Evidence Level: 5B

Link: <https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1303998/full>

Aflatoxin m(1) analysis in urine of mill workers in Bangladesh: A pilot study.

Background: Presence of aflatoxin B₁ (AFB₁) in food and feed is a serious problem, especially in developing countries. Human exposure to this carcinogenic mycotoxin can occur through dietary intake, but also through inhalation or dermal contact when handling and processing AFB₁-contaminated crops. A suitable biomarker of AFB₁ exposure by all routes is the occurrence of its hydroxylated metabolite aflatoxin M₁ (AFM₁) in urine. **Methods:** To assess mycotoxin exposure in mill workers in Bangladesh, we analysed AFM₁ levels in urine samples of this population group who may encounter both dietary and occupational AFB₁ exposure. In this pilot study, a total of 76 participants (51 mill workers and 25 controls) were enrolled from the Sylhet region of Bangladesh. Urine samples were collected from people who worked in rice, wheat, maize and spice mills and from controls with no occupational contact to these materials. A questionnaire was used to collect information on basic characteristics and normal food habits of all participants. Levels of AFM₁ in the urine samples were determined by a competitive enzyme linked immunosorbent assay. **Results:** AFM₁ was detected in 96.1% of mill workers' urine samples with a range of LOD (40) of 217.7 pg/mL and also in 92% of control subject's urine samples with a range of LOD of 307.0 pg/mL. The mean level of AFM₁ in mill workers' urine (106.5 ± 35.0 pg/mL) was slightly lower than that of the control group (123.3 ± 52.4 pg/mL), whilst the mean AFM₁ urinary level adjusted for creatinine was higher in mill workers (142.1 ± 126.1 pg/mg crea) than in the control group (98.5 ± 71.2 pg/mg crea). Yet, these differences in biomarker levels were not statistically significant. Slightly different mean urinary AFM₁ levels were observed between maize mill, spice mill, rice mill, and wheat mill workers, yet biomarker values are based on a small number of individuals in these subgroups. No significant correlations were found between the study subjects' urine AFM₁ levels and their consumption of some staple food items, except for a significant correlation observed between urinary biomarker levels and consumption of groundnuts. In conclusion, this pilot study revealed the frequent presence of AFM₁ in the urine of mill workers in Bangladesh and those of concurrent controls with dietary AFB₁ exposure only. **Conclusions:** The absence of a statistical difference in mean biomarker levels for workers and controls suggests that in the specific setting, no extra occupational exposure occurred. Yet, the high prevalence of non-negligible AFM₁ levels in the collected urines encourage further studies in Bangladesh regarding aflatoxin exposure.

Ali et al. 2024.

Toxins, vol. 16, no. 1.

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Keywords: Bangladesh; ELISA; aflatoxin; exposure; mill workers; urine.

Evidence Level: 3B

Link: <https://www.mdpi.com/2072-6651/16/1/45>

Higher serum concentrations of PFAS among pesticide exposed female greenhouse workers.

Background: Long-chained poly- and perfluoroalkyl substances (PFAS) have been used in pesticide formulations but their potential impact on human PFAS exposure has not been addressed. **Objectives:** To investigate if occupationally pesticide exposed female greenhouse workers in Denmark had higher serum concentrations of PFAS than a comparable background population. **Methods:** Serum samples collected between 1996 and 2001 from 181 pregnant greenhouse workers and a contemporary urban population of 48 pregnant women were analysed for eight PFAS: perfluorooctane sulfonate (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorodecanoic acid (PFDA), perfluorooctane sulfonamide (FOSA), N-methyl perfluorooctane sulfonamido acetic acid (N-MeFOSAA), and N-ethyl perfluorooctane sulfonamido acetic acid (N-EtFOSAA). **Results:** The concentrations of PFOA, PFOS, and the PFOS precursors N-MeFOSAA, N-EtFOSAA, and FOSA were higher,

and PFHxS was lower, among greenhouse workers than the comparison population. After adjusting for age and parity, serum concentrations of N-MeFOSAA, N-EtFOSAA, and FOSA were 2-to-3-fold higher, and the major PFAS in serum, PFOS and PFOA, were 30-50 % higher among the greenhouse workers.

Conclusion: Higher serum concentrations of some legacy PFAS among female greenhouse workers indicate that exposure to pesticides is a potential pathway of exposure. Although PFAS use in pesticide applications may appear to be a minor source of exposure for the general population, this pathway deserves attention in risk assessment.

Andersen et al. 2024.

International Journal of Hygiene and Environmental Health, vol. 255.

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Keywords: Exposure; greenhouse workers; occupational; PFAS; pesticides; serum concentrations.

Evidence Level: 3B

Link: [https://linkinghub.elsevier.com/retrieve/pii/S1438-4639\(23\)00183-9](https://linkinghub.elsevier.com/retrieve/pii/S1438-4639(23)00183-9)

Impact of occupational heat exposure on selected haematological parameters of bakery workers: A comprehensive study in Ilorin, Kwara State.

Background: The Occupational Health and Safety Administration has identified indoor industries at risk of experiencing heat-related illnesses due to the presence of heat-generating appliances; these include bakeries, kitchens, laundries, and furnaces. **Methods:** This study aimed to assess the effects of heat stress on hematological parameters and erythrocyte sedimentation rates (ESR) of bakery workers in Ilorin, Kwara State. It was a cross-sectional study, involving laboratory analysis, which lasted for 3 months. A total of 60 Male and female bakery workers aged between 18 and 65 years with 1 or more years of working experience were recruited for this study. Full blood count estimation was carried out using hematological analyzer (Sysmex-2000) and the ESR was carried out using the Westergren method in the Hematology unit, Kwara State University, Malete. Results were analyzed using SPSS version 20. **Results:** This study found the bakery workers to have low ESR (2.13 ± 1.28) compared to (10.05 ± 4.95) of the control, the RBC was high (6.708 ± 2.08) compared to (5.46 ± 1.12) of the control group. TWBC was also found to be high (7.425 ± 1.74) compared to (6.95 ± 2.49) of the control population. Findings from this study concluded that working under high temperatures negatively affected the health of bakery workers with reports of heat stress-related symptoms and also affected ESR and hematological parameters.

Conclusions: A comprehensive and effective national occupational health and safety program that includes relevant policies, decrees, and proper enforcement is needed to ensure the worker's safety and health both in the formal and the fast-growing informal sectors.

Anyiam et al. 2024.

Medicine, vol. 103, no. 2.

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Keywords: Occupational heat exposure; heat-related illness; bakery.

Evidence Level: 3B

Link: https://journals.lww.com/md-journal/fulltext/2024/01120/impact_of_occupational_heat_exposure_on_selected.56.aspx

A cross-sectional study on occupational exposure to microorganisms, endotoxin, hydrogen sulfide, and dust during work at drilling waste treatment plants.

Background: This cross-sectional study aims to obtain knowledge about workers' exposure to airborne dust, bacterial and fungal species, endotoxin, biofilm formation, and hydrogen sulfide (H₂S) in drilling waste treatment plants. **Methods:** In total, 408 full-shift personal samples, 66 work areas, 40 drilling waste, and reference (outdoor air and seawater) samples were analyzed. Some workers were exposed to high levels of endotoxin (207 EU/m³), bacteria (3.8×10^4 colony forming units (CFU)/m³ and 9.8×10^4 DNA copies/m³), or fungi (1.4×10^7 CFU/m³ and 3,600 copies/m³). **Results:** The exposure levels to endotoxin, bacteria, and peaks of H₂S were dependent on the treatment technique. All types of drilling waste contained large concentrations of bacteria compared to the seawater references. Elevated

concentrations of airborne bacteria were found close to drilling waste basins. In total, 116, 146, and 112 different bacterial species were found in workers' exposure, work areas, and the drilling waste, respectively. An overlap in bacterial species found in the drilling waste and air (personal and work area) samples was found. Of the bacterial species found, 49 are classified as human pathogens such as *Escherichia coli*, *Enterobacter cloacae*, and *Klebsiella oxytoca*. In total, 44 fungal species were found in the working environment, and 6 of these are classified as human pathogens such as *Aspergillus fumigatus*. In conclusion, across the drilling waste treatment plants, human pathogens were present in the drilling waste, and workers' exposure was affected by the drilling waste treated at the plants with elevated exposure to endotoxin and bacteria. **Conclusions:** Elevated exposure was related to working as apprentices or chemical engineers, and working with cleaning, or slop water, and working in the daytime. **Daae et al. 2024.**

Annals of Work Exposures and Health, vol. 68, no. 1.

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Keywords: *Aspergillus fumigatus*; bioaerosol; green transition; risk group 2 pathogens; slop water; wastewater.

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10773208/>

Occupational exposure to pesticides deregulates systemic cortisol levels in women with breast cancer and correlates with poor prognosis features.

Background: Pesticides have been pointed out as hormone disruptors and may significantly affect the prognosis of hormone-dependent diseases such as breast cancer (BC). Here, we investigated the impact of occupational pesticide exposure on systemic cortisol levels in female rural workers diagnosed with BC.

Methods: Occupational exposure was assessed by interviews with a standardized questionnaire. Plasma samples (112 from pesticide-exposed women and 77 from unexposed women) were collected in the afternoon, outside the physiological cortisol peak, and analyzed by a chemiluminescent paramagnetic immunoassay for the quantitative determination of cortisol levels in serum and plasma. **Results:** The results from both groups were categorized according to patients' clinicopathological and exposure data. BC pesticide-exposed women presented higher levels of cortisol than the unexposed. Higher cortisol levels were also detected in the exposed group with more aggressive disease (triple-negative BC), with tumors over 2 cm, with lymph node metastases, and with high risk of disease recurrence and death.

Conclusions: These findings demonstrated that there is an association between pesticide exposure and BC that affected cortisol levels and correlated to poor disease prognosis.

Jumes et al. 2024.

Brazilian Journal of Medical and Biological Research, vol. 22.

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Keywords: Pesticides; cortisol; breast cancer; prognosis; hormones.

Evidence Level: 5B

Link: <https://www.scielo.br/j/bjmb/a/Jf6VVDFPG5JbL3bRcgx9Npf/?lang=en>

Sedentary Practices

This month in Sedentary Practices we explore issues associated with improving movement behaviour in office workers and the effectiveness and correlates of a multicomponent intervention to reduce sitting at work.

Improving movement behavior in office workers: Effects of two multi-level cluster-RCT interventions on mental health.

Background: We have previously reported on the design and efficacy of two cluster-randomized multi-level workplace interventions, attempting to decrease sedentary behavior (SED) or increase moderate to vigorous physical activity (MVPA) among office workers to improve mental health outcomes. The aim of

this study was to investigate intervention effects on mental health outcomes, i.e., mental wellbeing, depression or anxiety symptoms, and stress immediately after the 6-month intervention period.

Methods: Teams of 263 office workers were cluster-randomized to one of two interventions or a waitlist control group. The PA intervention (iPA) focused on increasing MVPA and the SED intervention (iSED) on reducing SED. Both multi-level interventions targeted individual office workers and their social, physical, and organizational work environment, incorporating counselling based on cognitive behavioral therapy and motivational interviewing. Mental health outcomes were assessed using validated questionnaires before and immediately after the intervention. Intervention effects were analysed using linear mixed effects models. **Results:** Participants were mostly female and highly educated, with a mean age of 42 years and had favorable levels of mental health at baseline. Mental wellbeing improved for the iSED group ($\beta = 8$, 95% CI 1 to 15, $p = 0.030$) but not for the iPA group ($\beta = 6$, 95% CI -1 to 12, $p = 0.072$) compared to the control group. No effects were found for depression or anxiety symptoms or stress.

Conclusions: The multi-level interventions improved mental wellbeing among this population of office workers, reaching statistical significance in the iSED group. The size of the effect can be regarded meaningful, considering favorable mental health and high PA level at baseline. Thus, workplace interventions that provide support on multiple levels appear to have potential for improving mental wellbeing, but not reducing ill-health variables, among healthy office workers. More research is needed to understand the mechanisms through which such improvements can be achieved and to identify the most effective intervention components.

Larisch et al. 2024.

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

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Keywords: Behavior change; mental health; mental wellbeing; office workers; physical activity; sedentary behavior; workplace health promotion.

Evidence Level: 3A

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-17647-2>

What it takes to reduce sitting at work: A pilot study on the effectiveness and correlates of a multicomponent intervention.

Background: This study aimed to assess the feasibility and effects of a simple-to-implement multicomponent intervention to reduce sedentary time of office workers. **Methods:** Six groups of eight to ten office workers took part in the two-week Leicht Bewegt intervention. Participants completed questionnaires at baseline (T0, $n = 52$), after 2 weeks (T1, $n = 46$), and after 5 weeks (T2, $n = 38$), including subjective sedentary measures and social-cognitive variables based on the health action process approach (HAPA). Objective sedentary measures were obtained using activPAL trackers. **Results:** The intention to reduce sedentary behavior during work increased significantly from T0 to T1. Participants' objective and subjective sitting time decreased significantly from T0 to T1, corresponding to an average decrease per 8-h-workday of 55 min ($d = -.66$) or 74 min ($d = -1.14$), respectively. This reduction persisted (for subjective sitting time) at T2 ($d = -1.08$). Participants indicated a high satisfaction with the intervention.

Conclusions: The Leicht Bewegt intervention offers a feasible and effective opportunity to reduce sedentary behavior at work. Randomized controlled trials including longer follow-up time periods are needed to validate its benefits in different workplaces.

Porath et al. 2024.

International Archives of Occupational and Environmental Health, vol. 97, no. 1.

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Keywords: Health action process approach; health behavior change; multicomponent intervention; occupational health; sedentary behavior; workplace intervention.

Evidence Level: 3B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10791766/>

Physical Activity

This month in Physical Activity we explore issues associated with occupational physical activity, all-cause mortality and cardiovascular diseases/ mortality and risk of metabolic syndrome due to physical activity and posture behaviours.

Occupational physical activity, all-cause mortality and incidence of cardiovascular diseases: Results from three Italian cohorts.

Background: To examine the association of exposure to Occupational Physical Activity (OPA) with all-cause mortality and incidence of cardiovascular diseases (CVD). **Methods:** The study population was composed of three Italian cohorts: a national cohort of employees participating in the National Health Survey 2005, followed-up until 2014 (ILS 2005), and two urban cohorts of employees resident in Turin at 2001 and 2011 censuses (TLS 2001 and TLS 2011, respectively), both followed-up until 2018. Follow-up was conducted through individual record-linkage with death registries and hospital admissions archives. Exposure to OPA was assigned through an Italian job-exposure matrix (JEM). Relative Risks of both CVD incidence and overall mortality associated with OPA quartiles (IRR) were estimated using Poisson regression models adjusted for socio-demographics and health, and in the national cohort, also for leisure time physical activity, BMI, smoking, diabetes, and hypertension. **Results:** Compared to the lowest quartile, the highest OPA quartile was associated in both genders with significantly increased mortality in TLS 2001 (IRR = 1.11 among men, IRR = 1.20 among women) and in TLS 2011 (IRR = 1.27 among men and IRR = 1.73 among women), whereas in the ILS 2005 cohort no association was found. Among women, high OPA was also associated with CVD risk in TLS 2001 and 2011 (IRR = 1.39 and IRR = 1.16 for the highest quartile, respectively), while in the ILS cohort in both genders only the third quartile showed a significantly higher risk. **Conclusion:** Our results indicate that OPA does not have a beneficial effect on CVD and mortality, but rather suggest that it may produce deleterious health effects.

Fontana et al. 2024.

International Archives of Occupational and Environmental Health, vol. 97, no. 1.

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Keywords: Cardiovascular diseases; epidemiology; job-exposure matrix; longitudinal studies; mortality; occupational physical activity.

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10791782/>

Occupational sitting time, leisure physical activity, and all-cause and cardiovascular disease mortality.

Background: For the first time, the 2020 World Health Organization guidelines on physical activity recommended reducing sedentary behaviors owing to their health consequences. Less is known on the specific association of prolonged occupational sitting with health, especially in the context of low physical activity engagement. **Objective:** To quantify health risks associated with prolonged occupational sitting and to determine whether there is a certain threshold of physical activity that may attenuate it. **Methods:** Design, setting, and participants: This prospective cohort study included participants in a health surveillance program in Taiwan who were followed-up between 1996 and 2017. Data on occupational sitting, leisure-time physical activity (LTPA) habits, lifestyle, and metabolic parameters were collected. Data analysis was performed in December 2020. **Main outcomes and measures:** The all-cause and cardiovascular disease (CVD) mortality associated with 3 occupational sitting volumes (mostly sitting, alternating sitting and non-sitting, and mostly non-sitting) were analyzed applying multivariable Cox regression models to calculate the hazard ratios (HRs) for all participants and by subgroups, including 5 LTPA levels and a personal activity intelligence (PAI)-oriented metric. Deaths occurring within the initial 2 years of follow-up were excluded to prevent reverse causality. **Results:** The total cohort included 481 688 participants (mean [SD] age, 39.3 [12.8] years; 256 077 women [53.2%]). The study recorded 26 257 deaths during a mean (SD) follow-up period of 12.85 (5.67) years. After adjusting for sex, age, education, smoking, drinking, and body mass index, individuals who mostly sat at work had a 16% higher all-cause

mortality risk (HR, 1.16; 95% CI, 1.11-1.20) and a 34% increased mortality risk from CVD (HR, 1.34; 95% CI, 1.22-1.46) compared with those who were mostly non-sitting at work. Individuals alternating sitting and non-sitting at work did not experience increased risk of all-cause mortality compared with individuals mostly non-sitting at work (HR, 1.01; 95% CI, 0.97-1.05). For individuals mostly sitting at work and engaging in low (15-29 minutes per day) or no (<15 minutes per day) LTPA, an increase in LTPA by 15 and 30 minutes per day, respectively, was associated with a reduction in mortality to a level similar to that of inactive individuals who mostly do not sit at work. In addition, individuals with a PAI score exceeding 100 experienced a notable reduction in the elevated mortality risk associated with prolonged occupational sitting. **Conclusions:** As part of modern lifestyles, prolonged occupational sitting is considered normal and has not received due attention, even though its deleterious effect on health outcomes has been demonstrated. In this study, alternating between sitting and non-sitting at work, as well as an extra 15 to 30 minutes per day of LTPA or achieving a PAI score greater than 100, attenuated the harms of prolonged occupational sitting. Emphasizing the associated harms and suggesting workplace system changes may help society to denormalize this common behavior, similar to the process of denormalizing smoking.

Gao et al. 2024.

JAMA Network Open, vol. 7, no. 1.

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Keywords: Occupational sitting time; leisure physical activity; cardiovascular disease; mortality.

Evidence Level: 4B

Link: <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2814094>

Risk of metabolic syndrome among law enforcement officers due to physical activity and posture behaviors.

Background: There are limited data on objectively measured activity and postural behaviors of law enforcement officers (LEOs) in relation to risk of metabolic syndrome (MetS). Objectives: To examine the associations between objectively measured activity and postural behaviors and MetS risk among LEOs.

Methods: Thirty-one LEOs, mean (SD) age 33 (10) years, participated in the study. LEOs had their metabolic risk factors measured using blood samples after fasting for at least 10 hours prior to testing. Participants wore activity-monitoring devices for 7 consecutive days during on-duty and off-duty shifts. Eighteen participants adhered to wearing the devices. Descriptive statistics were used to determine means for all MetS risk factors; time in intensity-specific physical activity behaviors; and time in various postural shifts. Correlation analyses were employed to examine relationships between activity behaviors, postures, and MetS risk factors. **Results:** Over half (51.6%; n = 16) of the participants had 2 or more positive MetS risk factors. Mean (SD) on-duty sedentary behavior was 273 (59) minutes compared with off-duty sedentary behavior of 401 (146) minutes. Mean on-duty moderate-intensity activity was 236 (40) minutes compared with off-duty moderate-intensity activity of 305 (80) minutes. Average on-duty sitting time was 435 (69) minutes compared with off-duty sitting time of 528 (142) minutes. Average on-duty standing time was 116 (43) minutes compared with off-duty standing time of 171 (51) minutes. There were negative correlations between on-duty sedentary activity and Systolic Blood Pressure (r = -0.48) and Diastolic Blood Pressure (r = -0.48), respectively. **Conclusions:** Law enforcement officers have unfavorable activity and postural behaviors during a typical day regardless of working status and may be at risk for developing MetS.

Johnson et al. 2024.

Journal of Occupational Health, vol. 66, no. 1.

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Keywords: Law enforcement; metabolic syndrome risk; objective measurement; physical activity.

Evidence Level: 3B

Link: <https://academic.oup.com/joh/article/66/1/uiad005/7404916?login=true>

Musculoskeletal Health

This month in Musculoskeletal Health we explore issues associated with the use of upper limb exoskeletons, the relationship between occupational-specific task performance and measures of physical fitness, cardiovascular and musculoskeletal health, and factors influencing pain medication and opioid use in patients with musculoskeletal injuries. In other studies, we explore the use of biofeedback training in combination with ergonomic information, the efficacy of conservative interventions for musculoskeletal conditions on pain and disability and the biopsychosocial rehabilitation in the working population with chronic low back pain.

Influence of an upper limb exoskeleton on muscle activity during various construction and manufacturing tasks.

Background: Musculoskeletal disorders (MSDs) significantly impact workers in the manufacturing and construction sectors. One solution that has gained interest to reduce MSDs incidence is the use of exoskeletons. **Methods:** In this study, the influence of an upper limb exoskeleton on muscle activity was investigated experimentally for three commonly performed tasks in the manufacturing and construction sectors. The tasks tested were overhead assembly, bricklaying, and box moving tasks. Eighteen males participated in the tests. **Results:** The results showed a reduction in shoulder flexor muscle activation during all three tasks (up to $-45.46 \pm 4.52\%$ for the anterior deltoid), but increased extensor activation (up to $15.47 \pm 8.01\%$ for the latissimus dorsi) was observed when the task was not primarily performed above shoulder level. **Conclusions:** The results revealed the dependence of the upper-body exoskeleton on tasks and arm posture, which should be considered for both in-field applications and designing new exoskeletons for performance enhancement.

Musso et al. 2024.

Applied Ergonomics, vol. 114.

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Keywords: EMG; MSDs; upper-limb exoskeleton; work-related musculoskeletal disorder.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0003687023001965?via%3Dihub>

Evaluation of the relationship between occupational-specific task performance and measures of physical fitness, cardiovascular and musculoskeletal health in firefighters.

Background: Firefighters are required to perform physically strenuous tasks such as hose drags, victim rescues, forcible entries and stair climbs to complete their public safety mission. Occupational-specific tasks are often used to evaluate the ability of firefighters to adequately/safely perform their duties. Depending on the regions, occupational-specific tasks include six to eight individual tasks, which emphasize distinct aspects of their physical fitness, while also requiring different levels of cardiovascular (CVH) and musculoskeletal health (MSH). Therefore, the aim of this study was to evaluate the relationship between specific occupational task performance and measures of physical fitness, cardiovascular and musculoskeletal health. **Methods:** Using a cross-sectional design, 282 full-time male and female firefighters were recruited. A researcher-generated questionnaire and physical measures were used to collect data on sociodemographic characteristics, CVH, MSH and weekly physical activity habits. Physical measures were used to collect data on physical fitness and occupational-specific task performance. **Results:** Absolute cardiorespiratory fitness ($ab\dot{V}O_{2max}$), grip strength, leg strength, push-ups, sit-ups and lean body mass (all $p < 0.001$) had an inverse association with completion times on all occupational-specific tasks. Age was positively related to the performance of all tasks (all $p < 0.05$). Higher heart rate variability (HRV) was associated with better performance on all tasks (all $p < 0.05$). Bodyfat percentage (BF%) and diastolic blood pressure were positively associated with the step-up task ($p < 0.05$). Lower back musculoskeletal injury (LoBMSI), musculoskeletal discomfort (MSD), and lower limb MSD were associated with a decreased odds of passing the step-up. Upper body MSIs (UBMSI), LoBMSIs and Lower back MSD were associated with decreased odds of passing the rescue drag. **Conclusion:** Firefighters that were taller,

leaner, stronger and fitter with a more favourable CVH profile, higher HRV and less musculoskeletal discomfort performed best on all occupational-specific tasks.

Ras et al. 2024.

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

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Keywords: Cardiorespiratory fitness; discomfort; endurance; firefighting; hypertension; injury; obesity; physical fitness; strength; task performance.

Evidence Level: 4A

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-17487-6>

Factors influencing pain medication and opioid use in patients with musculoskeletal injuries: A retrospective insurance claims database study.

Background: Opioid use is only recommended in selected cases of musculoskeletal (MSK) injuries. We assessed factors associated with increased opioid use in MSK injuries. **Methods:** In a retrospective analysis of over four million workers with MSK injuries using the Swiss National Accident Insurance Fund (Suva) database, we analyzed risk factors by multivariate logistic regression. **Results:** Injury severity was associated with pain medication, opioid, and strong opioid use. Whereas fractures, contusions, and ruptures had higher odds for any pain medication use, increased odds for strong opioids were observed in fractures, superficial injuries, and other injuries. Injuries of the shoulders, elbow, chest, back/spine, thorax, and pelvis/hips showed high odds for opioid use (odds ratio (OR) > 2.0). Injuries of the shoulders had higher odds for strong opioid use (OR 1.136; 95% CI 1.040-1.241). The odds for using strong opioids increased from 2008 OR 0.843 (95% confidence interval (CI) 0.798-0.891) to 2018 OR 1.503 (95% CI 1.431-1.578), compared to 2013. Injury severity, type of injury, and injured body parts influenced the use of pain medication and overall opioid use in musculoskeletal injuries. **Conclusions:** Strong opioids were more often used in fractures but also in superficial and other minor injuries, which indicates that other factors play a role when prescribing strong opioids.

Scholz et al. 2024.

Scientific Reports, vol. 14, no. 1.

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Keywords: Pain medication; opioid use; musculoskeletal injuries.

Evidence Level: 4B

Link: <https://www.nature.com/articles/s41598-024-52477-7>

Can biofeedback training in combination with ergonomic information reduce pain among young adult computer users with neck and upper extremity symptoms?: A randomized controlled intervention study.

Background: The aim of this randomized controlled study was to explore if an intervention with biofeedback training in combination with ergonomic discussions, could improve working technique and work postures, and reduce pain intensity and perceived exertion in young adult computer users with ongoing neck and upper extremity symptoms. **Methods:** 39 participants were divided into an intervention group and a control group. The intervention consisted of 4 sessions during a three-month period. Working technique, working postures, rated perceived exertion, pain intensity, and duration of computer use were measured at baseline and follow ups after 6 and 12 months. **Results:** The intervention did not significantly improve working technique and working postures, nor reduce pain intensity and perceived exertion in the intervention group compared to the control group. However, there was a statistically significant reduction in reported pain intensity in the neck/shoulder for the whole group. **Conclusions:** There was a trend that time spent with computer work without breaks was more reduced in the intervention group than in the control group.

Lindegård et al. 2024.

Applied Ergonomics, vol. 114.

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Keywords: Musculoskeletal disorders; perceived exertion; working technique.

Evidence Level: 2A

Link: <https://www.sciencedirect.com/science/article/pii/S000368702300193X?via%3Dihub>

Efficacy of conservative interventions for musculoskeletal conditions on pain and disability in active serving military personnel: A systematic review.

Background: Musculoskeletal (MSK) injuries and associated pain disorders are one of the leading causes for soldiers not being medically fit for deployment, impacting force capability and readiness. Musculoskeletal pain continues to be a leading cause of disability within military services and is associated with a substantial financial burden. A better understanding of the effectiveness of MSK pain management strategies is required. This review was designed to determine the efficacy of nonsurgical interventions, such as physiotherapy, exercise, pharmacology, and multidisciplinary programs, to manage MSK conditions in active serving military populations. **Methods:** MEDLINE, Embase, CINAHL, and SPORTDiscus were searched to identify relevant randomized clinical trials. Recommended methods were used for article identification, selection, and data extraction. The Cochrane Risk of Bias tool and the Grade of Recommendation, Assessment, Development, and Evaluation were used to appraise the studies. Where possible, meta-analyses were performed. The review was conducted according to the PRISMA guidelines. **Results:** Nineteen articles (1,408 participants) met the eligibility criteria. Low back pain (LBP) was the most frequently investigated condition, followed by knee pain, neck pain, and shoulder pain. Early physiotherapy, exercise and adjunct chiropractic manipulation (for LBP), and multidisciplinary pain programs (physiotherapy, occupational therapy, and psychology) (for chronic MSK pain) improved pain (standardized mean difference ranged from -0.39 to -1.34; low strength of evidence). Participation in multidisciplinary pain programs, adjunct chiropractic manipulation, and early physiotherapy improved disability (for LBP) (standardized mean difference ranged from -0.45 to -0.86; low to very low strength of evidence). No studies evaluated pain medication. Dietary supplements (glucosamine, chondroitin sulfate, and manganese ascorbate), electrotherapy, isolated lumbar muscle exercises, home cervical traction, or training in virtual reality showed no benefit. The studies had a high risk of bias, were typically underpowered, and demonstrated high clinical heterogeneity. **Conclusions:** Currently available randomized clinical trials do not provide sufficient evidence to guide military organizations or health care professionals in making appropriate treatment decisions to manage MSK pain in active serving military personnel. Future research is essential to enable evidence-based recommendations for the effective management of MSK pain conditions in this unique population.

Bounds et al. 2024.

Military Medicine, vol. 189, no. 1-2.

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Keywords: Musculoskeletal conditions; injuries; pain disorders; disability; military.

Evidence Level: 1A

Link: <https://academic.oup.com/milmed/article/189/1-2/e66/7017997?login=true>

Biopsychosocial rehabilitation in the working population with chronic low back pain: A concept analysis.

Background: To identify the essential attributes of biopsychosocial rehabilitation for chronic low back pain in the working population. Design: A concept analysis was conducted according to the 8-step method of Walker and Avant. This framework provides a clear concept and theoretical and operational definitions. **Methods:** Five databases were searched, followed by a systematic screening. Subsequently, attributes, illustrative cases, antecedents, consequences and empirical referents were formulated. **Results:** Of the 3793 studies identified, 42 unique references were included. Eleven attributes were identified: therapeutic exercise, psychological support, education, personalization, self-management, participation, follow-up, practice standard, goal-setting, social support, and dietary advice. Subsequently, illustrative cases were described. Antecedents, such as motivation, preparedness and a multidisciplinary team, were found, together with consequences such as decreased pain, less sick-leave and increased function and work status. Finally, examples of empirical referents were given. **Conclusion:** This study identified the attributes that are necessary to develop biopsychosocial rehabilitation intervention programmes for chronic low back pain. The defined concept of biopsychosocial rehabilitation for chronic low back pain

may serve as a solid base to further develop and apply interventions. Future research should focus on the objectification of biopsychosocial rehabilitation and conceptualization regarding how personalization is done.

Ceulemans et al. 2024.

Journal of Rehabilitation Medicine, vol. 56.

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Keywords: Chronic low back pain; biopsychosocial rehabilitation; working population.

Evidence Level: 6A

Link: <https://medicaljournalssweden.se/jrm/article/view/13454>

Effects of a passive shoulder exoskeleton on muscle activity among Danish slaughterhouse workers.

Background: To evaluate the effect of a shoulder exoskeleton on muscle activity and to compare the effect with a lifting glove among slaughterhouse workers in occupational settings. **Methods:** We conducted a crossover study of 26 workers measured during two work days with and without the use of a passive shoulder exoskeleton and a lifting glove at a Danish slaughterhouse. Electromyography sensors were placed bilateral on 5 shoulder muscles. The 10th, 50th, and 90th percentiles of muscle activity normalized by maximal voluntary contractions were measured and analyzed using mixed effect models. **Results:** For the 50th percentiles of the agonist muscles, the exoskeleton reduced muscle activity bilaterally for deltoid anterior with up to 29.47%, deltoid middle with 10.22%, and upper trapezius with 22.21%. The lifting glove only reduced muscle activity for right deltoid anterior (36.59%) and upper trapezius (7.11%), but generally increased left muscle activity with up to 15.58%. **Conclusion:** The exoskeleton showed larger reductions in muscle activity compared to the lifting glove.

Dalbøge et al. 2024.

Applied Ergonomics, vol. 114.

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Keywords: Assistive device; mechanical exposure; occupation.

Evidence Level: 3B

Link: <https://www.sciencedirect.com/science/article/pii/S0003687023001497?via%3Dihub>

Guiding and Supporting Mental Health and Wellbeing

Mental Health

This month in Mental Health we explore issues associated with occupational burnout and sleep duration and perceived stress, self-esteem and occupational factors and anxiety and depression, mental health and Covid-19 lockdowns, drivers of suicide in the construction industry and cognitive and behavioural approaches to occupational stress management.

Association between sleep duration and burnout in healthcare professionals: A cross-sectional survey.

Background: Short sleep duration in healthcare professionals is a recurring concern among researchers. On the other hand, the prevalence of burnout in this population group is experiencing exponential growth. Therefore, this study aimed to explore the association between sleep duration and burnout in healthcare professionals. **Methods:** This is a cross-sectional study. Data were collected by applying a non-probabilistic convenience sampling, considering a sample of 300 healthcare professionals from the public sector in Peru. The association between variables was explored using multivariate logistic regression. Values of $p < 0.05$ were considered statistically significant. **Results:** The results of the analysis in the crude models revealed that both men and women who slept < 7 h during workdays and days off were 8.33 (95% CI = 2.68-13.99, $p = 0.004$) and 17.18 (95% CI = 10.50-23.87, $p < 0.001$) times more likely to have burnout compared to those who reported ≥ 7 h, respectively. After adjusting for confounding variables, the association remained statistically significant. **Conclusion:** The findings of this study underscore the critical

importance of sleep duration in the incidence of burnout among healthcare professionals. In the context of the global challenges to the mental and physical health of these professionals, our results highlight the urgent need to implement strategies at the organizational and individual level. This includes promoting a better work-life balance, and effective stress management and improved sleep quality.

Saintila et al. 2024.

Frontiers in Public Health, vol. 11.

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Keywords: Peru; burnout; healthcare professionals; occupational burnout; sleep duration.

Evidence Level: 4B

Link: <https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1268164/full>

The mediating effect of hope agency on perceived stress and professional burnout among Polish corporate employees.

Background: Job burnout is considered an outcome of prolonged exposure of employees to stress. Although many studies have focused on the presence of a direct association between stress and burnout, we still know very little about mediators that indirectly play a role in this relationship. Previous analyses have determined that self-efficacy acts as a mechanism that explains the overall relationship between stress and burnout. However, there is no such evidence to support the mediatory function of hope.

Methods: Therefore, the main aim of the current study was to verify whether self-efficacy, hope pathways, and hope agency are mediators in this relationship. The study included 408 Polish-speaking adults who completed the Perceived Stress Scale, the Maslach Burnout Inventory, the Generalized Self-Efficacy Scale, and the Dispositional Hope Scale. **Results:** The outcomes indicated a positive correlation of stress with the overall burnout score, as well as all subscales. Moreover, hope agency was a mediator, thus suggesting that there is also an indirect relationship between stress and job burnout. Therefore, it can be assumed that higher stress is associated with lower motivation to generate and sustain the actions needed to reach the goals. **Conclusions:** Consequently, lower hope agency may lead stressed employees to greater exhaustion and reduced personal accomplishment.

Szczęśniak et al. 2024.

Scientific Reports, vol. 14, no. 1.

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Keywords: Job burnout; stress; corporate employees; exposure.

Evidence Level: 5B

Link: <https://www.nature.com/articles/s41598-024-52289-9>

Self-esteem and occupational factors as predictors of the incidence of anxiety and depression among healthcare workers during the COVID-19 pandemic in Latvia.

Background: The prevalence of depression and anxiety among healthcare workers (HCWs) during the COVID-19 pandemic is high. **Methods:** The aim of the study is to identify the importance of self-esteem and occupational factors in association with the incidence of depression and anxiety among HCWs through a longitudinal cohort study during the COVID-19 pandemic in Latvia. Participants received seven questionnaires during the COVID-19 pandemic on demographic parameters, work-related information, and contact with COVID-19 patients, and three standardized questionnaires that evaluated symptoms of anxiety (GAD-7), depression (PHQ-9), and self-esteem (Rosenberg's self-esteem scale). The Generalized Linear Mixed Model (GLMM) was used to identify factors associated with the incidence of depression and anxiety among HCWs. **Results:** A total of 322 participants were included in the data analysis for depression and 352 for anxiety. HCWs with low self-esteem were 83% more likely to experience depression and 76% more likely to experience anxiety. Working at a general practitioner practice is associated with twice the risk of developing depression and anxiety. A 31% increase in the odds of depression is observed among HCWs with direct contact with COVID-19 patients. **Conclusions:** The organizational and government levels must look for opportunities to facilitate the mental health of HCWs to ensure better-quality healthcare.

Valaine et al. 2024.

International Journal of Environmental Research and Public Health, vol. 21, no. 1.

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Keywords: COVID-19; anxiety; depression; healthcare workers; occupational factors; self-esteem.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/21/1/65>

Disentangling rates, risk, and drivers of suicide in the construction industry.

Background: Research suggests construction industry workers (CIWs) face increased suicide vulnerability. **Aims:** The current study synthesizes international evidence examining rates, risk, and drivers of CIW suicide. **Method:** Comprehensive searches of MEDLINE, PsycInfo, Embase, Emcare, Web of Science, Scopus, and gray literature were undertaken, identifying studies that discussed, theorized about, or demonstrated risks and/or rates and/or drivers of CIW suicide, without inclusion of other industries. **Results:** A number of included studies statistically analysed suicide outcomes in a variety of CIW populations, with the majority reporting increased rate and/or risk, however significant heterogeneity limited comparisons. Twenty-five potential drivers were identified and classified as personal- or industry-related. Disentanglement highlighted the relevance of previously understood personal drivers, need for future focus on industry drivers, and potential interplay between drivers. **Limitations:** Exclusion of non-English articles as well as inability to extend analysis to fully understand rates and/or risk of CIW suicide and tenuous links between suggested drivers and suicide outcomes. **Conclusion:** Despite limitations, this paper aids understanding in relation to the suggestion that CIWs are at increased suicide vulnerability. Disentanglement of potential drivers demonstrates the importance of future research focused on industry drivers to assist in prevention strategies.

Tyler et al. 2024.

Crisis, vol. 45, no. 1.

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Keywords: Construction industry; suicide; suicide prevention; systematic review.

Evidence Level: 2A

Link: <https://psycnet.apa.org/fulltext/2023-20598-001.html>

COVID-19 lockdowns and working women's mental health: Does motherhood and size of workplace matter? A comparative analysis using understanding society.

Background: The COVID-19 pandemic had detrimental and unequal repercussions on mental health. To date there is little evidence exploring how motherhood and workplace size moderates this relationship for working women. **Methods:** This study aimed to estimate changes in working women's mental health at the start of each UK lockdown and estimate the effect of motherhood and workplace size on mental health. We used Understanding Society data from women in paid employment, who participated in at least: one pre-COVID-19 Wave (9 or 10/11) and one COVID-19 lockdown wave (Lockdown 1: April 2020, Lockdown 2: November 2020, Lockdown 3: January 2021). Primary outcome was probable psychological distress (i.e., score ≥ 4 in the General Health Questionnaire-12 (GHQ-12)). **Results:** In Model 1, exposure was motherhood (binary), interacting with a variable that split time in the pre-pandemic and lockdown periods. In Model 2, workplace size (Micro: 1-24, Medium: 25-199, Large: More than 200 employees) was added as an exposure (3-way interaction) to investigate moderation effects. We fitted mixed-effects logistic regression models, adjusting for age, ethnicity, UK country of residence, cohabitation, educational qualifications, working hours, furlough, subjective financial difficulty and previous health condition. In the adjusted Model 1, pre-pandemic, odds of GHQ-12 caseness were lower for mothers compared to non-mothers (OR: 0.89 95%CI: 0.77, 1.03). However post-pandemic compared to pre-pandemic, odds for mothers were higher than non-mothers, especially during lockdown 3 (Non-mothers: OR: 1.93 95%CI: 1.69, 2.20; Mothers: OR: 2.87 95%CI: 2.36, 3.49). In Model 2, workplace size did not modify the relationship. Pre-pandemic, there was no difference in the odds of GHQ-12 caseness by workplace size; however, the differences observed in Lockdown 3 between non-mothers and mothers, are mainly attributed to differences in medium-sized enterprises (Non-mothers: OR: 1.95 95%CI: 1.53, 2.48; Mothers: OR: 3.56 95%CI: 2.54, 4.99). **Conclusions:**

Future policies should be designed to facilitate the working lives of mothers, but especially for medium-sized enterprises as extreme uncertainty appears to affect these employees more.

Wilson et al. 2024.

Social Science and Medicine, vol. 340.

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Keywords: COVID-19; employment; lockdown; mental health; mother; SME.

Evidence Level: 4B

Link: [https://linkinghub.elsevier.com/retrieve/pii/S0277-9536\(23\)00775-X](https://linkinghub.elsevier.com/retrieve/pii/S0277-9536(23)00775-X)

Cognitive and behavioural approaches to occupational stress management: The case of adult education administrative workers in Nigeria.

Background: Those in administrative positions in adult education are more likely to suffer from stress because of the hard work they do, long hours in the office, a lack of adequate medical and welfare packages, and a lack of financial aid. In this study, adult education workers in Nigeria were assessed on the effectiveness of a cognitive and behavioral approach to managing occupational stress in public administration. **Method:** This study was a group-randomized trial in which 94 adult education workers occupy public administrative positions within Enugu State, Nigeria, participated. Data were collected using 2 instruments, the Perceived Stress Scale, and the Workplace Stress Scale, which were validated by cognitive and behavioral psychologists at the University of Nigeria, Nsukka. The instruments contained internal construct and content validity as determined by Cronbach alpha. ANCOVA was employed to test for hypotheses and answer research questions. **Results:** This study demonstrates that cognitive and behavioral approaches are significantly effective in managing occupational stress among adult education workers who work for public agencies. **Conclusion:** To improve stress management capacity among adults in public administration positions, researchers recommend frequent exposure to cognitive and behavioral approaches.

Anyadike et al. 2024.

Medicine, vol. 103, no. 4.

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Keywords: Stress management; cognitive; behavioral; administration workers.

Evidence Level: 3B

Link: https://journals.lww.com/md-journal/fulltext/2024/01260/cognitive_and_behavioral_approaches_to.44.aspx

Psychosocial Issues

This month in Psychosocial Issues we explore issues associated with work interruptions of office workers, job demands and temporomandibular disorders;, associations between depressive symptoms and employment type, the effects of effort-reward imbalance on the job, overcommitment, and income on life satisfaction, the impact of psychosocial safety climate on public sector job satisfaction, the relationship between emotional labour, job burnout, and turnover intention among office workers and the relationship between work-family conflict and anxiety/depression.

Work interruptions of office workers: The influence of the complexity of primary work tasks on the perception of interruptions.

Background: Research demonstrates that work interruptions are considered one of the most common work stressors. Understanding the mechanisms of work interruptions is therefore vital to reducing worker stress and maintaining performance. **Objective:** The aim of this research is to investigate the influence of the frequency of work interruptions on subjective workload in the context of office work. Specifically, the mediating influence of interruption perception as well as the moderating influence of the complexity of

the primary task are examined. **Method:** The work interruptions of 492 office workers in Germany were collected by means of a one-day diary study. A mediation model and a conditional indirect effect model were calculated to examine the influence of interruption frequency on subjective workload, mediated by the individual perception of these interruptions as well as moderated by the complexity of the primary work tasks. **Results:** The analyses indicated a significant mediation and moderation. This implies that, on the one hand, the perception of work interruptions significantly mediates the relationship between the frequency of work interruptions and subjective workload. On the other hand, more complex primary work tasks seem to strengthen the positive relationship between interruption frequency and perceived interruption overload. **Conclusion:** The study underlines that work interruptions need to be considered in a much more differentiated way than is currently the case. Both in research and in terms of intervention measures in the work context, the various influencing factors need to be identified for an assessment of the effects on the working person to be possible.

Rick et al. 2024.

Work, vol. 77, no. 1.

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Keywords: Workload; digital work; knowledge work; office work; routine work; task complexity.

Evidence Level: 4B

Link: <https://content.iospress.com/articles/work/wor220684>

Job demands and temporomandibular disorders: mediating and moderating effects of psychological distress and recovery experiences.

Background: This study examined the relationship between recovery experience, job demands, psychological distress, and temporomandibular disorders (TMD) in Japanese workers. **Methods:** It used cross-sectional data from the fourth survey of a multi-wave longitudinal project, conducted using the registered monitors of an internet research company. Finally, 1278 respondents' data were analyzed (655 males, 623 females; mean [SD] age = 41.63 [10.31] years). We utilized Sugiaski's TMD screening question to assess TMD prevalence, Brief Job Stress Questionnaire to assess job demands, Kessler Psychological Distress Scale (K6) to assess psychological distress, and the Japanese version of the Recovery Experience Questionnaire to assess recovery experiences. The moderated mediation analysis was conducted using the Process macro program for SPSS developed by Preacher and Hayes, examining the effect of job demands on TMD through psychological distress, moderated by the recovery experience. **Results:** The results showed that 13.1% (n = 168) of the respondents had TMD. Mediation analysis indicated high job demands were associated with an increased TMD prevalence through psychological distress. The moderated mediation analysis revealed that relaxation and control moderated the relationship between job demands and psychological distress. **Conclusions:** This cross-sectional study established the relationship between job demands, psychological distress, and TMD among Japanese workers. The findings suggest that increased job demands contribute to high TMD prevalence through the mediation of psychological distress, moderated by relaxation and control.

Mori et al. 2024.

Journal of Occupational Health, vol. 66, no. 1.

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Keywords: Temporomandibular disorders; job demands; recovery.

Evidence Level: 4B

Link: <https://academic.oup.com/joh/article/66/1/uiad001/7380777?login=true>

Association between depressive symptoms and employment type of Korean workers: The Fifth Korean Working Conditions Survey.

Background: This study analysed the association between depressive symptoms and employment type, by considering both socioeconomic status and job stress factors. **Methods:** We analysed 27,369 participants (13,134 men and 14,235 women) using data from the fifth Korean Working Conditions Survey. The participants were divided into regular and precarious workers. Depressive symptoms were defined using the World Health Organization-5 Well-Being Index. A multivariate logistic regression

analysis was performed to assess the association between depressive symptoms and employment type. **Results:** Of the participants, 71.53% (N = 19578) were regular workers and 28.47% (N = 7791) were precarious workers. The weighted frequencies of participants with depressive symptoms (42.50%) were significantly higher than those of precarious workers (32.54%, $p < 0.001$). In the univariate and multivariate analyses, precarious workers had a significantly higher risk of depressive symptoms than regular workers (odds ratio [OR] 1.53, 95% confidence interval [CI] 1.42-1.64; OR 1.16, 95% CI 1.07-1.26, respectively). The significant association between depressive symptoms and precarious workers has also been reflected in propensity score matched participants through crude and multivariate analysis (OR 1.54 [95% CI 1.43-1.66] and OR 1.15 [95% CI 1.04-1.26], respectively). **Conclusions:** The findings suggest that precarious workers may have a higher risk of depressive symptoms than regular workers. However, this is only a cross-sectional study. Therefore, further study is required to investigate the relevance association between depressive symptoms and employment types.

Yang et al. 2024.

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

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Keywords: Depression; Korean working conditions survey; precarious worker; WHO-5 well-being index.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-17612-5>

The effects of effort-reward imbalance on the job, overcommitment, and income on life satisfaction in Germany from a longitudinal perspective.

Background: The effort-reward imbalance at work model offers a theoretical and analytical framework to estimate the subjective perception of work-related stress. High demands and low rewards in return can harm mental and physical health, well-being, and life satisfaction. According to the theory, overcommitment partially explains why employees endure such straining jobs. In Germany, cultural and economic aspects of labor differ between East and West. Incomes are lower in the East, while work centrality there is higher. In this article, the effects of effort-reward imbalance, overcommitment, and income on life satisfaction as well as their interactions with region were analyzed to gain a clearer picture of regional disparities regarding life satisfaction and the generality of this work stress model in Germany.

Methods: Data from 3848 participants from 2006 to 2011 of the German Socio-Economic Panel were analyzed. Within-between models were estimated, including fixed and random effects of the continuous form of effort-reward imbalance to predict subjective life satisfaction. Time-variant covariates - e.g., overcommitment or income - as well as time-constant variables - e.g., region, sex, education - were integrated. Differences in regional labor markets between East and West Germany were considered.

Results: Easterners exhibited higher imbalances and overcommitment than Westerners, indicating worse working conditions. Higher imbalances and overcommitment were associated with lower life satisfaction within and between participants, whereas for income only random effects were supported. While region did not moderate the effect of work stress, East Germans' life satisfaction benefitted more from a higher income. **Conclusion:** The importance of internal work structures in terms of recognition, adequate pay, advancement opportunities, or time pressure were underlined. As compared to the West, Easterners' life satisfaction benefitted more from higher income but not more from a lower imbalance or lower overcommitment. The interplay between materialistic and nonmaterialistic rewards at work should be focused on in the future.

Braunheim et al. 2024.

Social Science & Medicine, vol. 341

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Keywords: East/west Germany; effort-reward imbalance; life satisfaction; overcommitment; personal income; work stress.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S0277953623008808?via%3Dihub>

The impact of psychosocial safety climate on public sector job satisfaction: The moderating role of organizational climate.

Background: The purpose of this study is to uncover the effect of psychological safety climate (PSC) on employees' job satisfaction and organisational climate mediating processes explaining that association. It is posited that the four PSC aspects (management commitment, management priority, organisational participation, and organisational communication) are important for employees' job satisfaction and organisational climate act as resources to facilitate the enactment of managerial quality. **Methods:** This study uses a quantitative approach through a questionnaire survey method involving 340 Kota Kinabalu City Hall employees who were selected through simple random sampling. **Results:** The results of linear regression analysis found that organisation participation has a positive significant relationship with job satisfaction. Organisational communication also showed a negative and significant relationship with job satisfaction. Meanwhile, both management commitment and management priority are statistically insignificant. When the organisational climate is included in the relationship as a mediator through Structural Equation Modelling (SEM) to reinforce the role of psychological safety climate in increasing job satisfaction, such mediating role can only strengthen the relationship between management commitment and organisational participation with job satisfaction. **Conclusion:** Despite the study being cross-sectional, it contributes to knowledge on the resources facilitating PSC, which is important for employees' psychological health. From a practical viewpoint, this study contributes to the literature showing that organizations with good PSC should have policies and practices directed towards employee well-being. The implications of the study for DBKK management are to providing knowledge on the types of psychosocial safety climate domains that plays a crucial role in improving the job satisfaction of DBKK employees.

Lintanga et al. 2024.

BMC Psychology, vol. 12, no. 1.

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Keywords: Job satisfaction; organizational climate; psychological safety climate; public sector.

Evidence Level: 5B

Link: <https://bmcpyschology.biomedcentral.com/articles/10.1186/s40359-023-01513-8>

A study on the structural relationship between emotional labor, job burnout, and turnover intention among office workers in Korea: The moderated mediating effect of leader-member exchange.

Background: This research investigated the interplay of emotional labor, job burnout, and leader-member exchange on turnover intentions among office workers in South Korea. **Methods:** An online survey was conducted with 333 employees working in Korean small- and medium-sized enterprises. The target sample consisted of in-house employees who do not deal with external customers. All the measurement and structural models of this study were analysed using SPSS 27.0 and Amos 28.0. **Results:** The survey revealed that emotional labor indirectly influenced turnover intentions via job burnout and leader-member exchange. Deep acting intensified job burnout, thereby elevating turnover intentions, while surface acting mitigated job burnout. **Conclusions:** The findings underscored the importance of managing emotional labor and job burnout and fostering robust leader-member relationships to reduce staff turnover. Moreover, leader-member exchange was found to mitigate the effects of emotional labor on job burnout and turnover intention, with higher leader-member exchange reducing the negative impact of deep acting on turnover intention through job burnout.

Li et al. 2024.

BMC Psychology, vol. 12, no. 1.

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Keywords: Deep acting; korean employees; small- and medium-sized enterprises; surface acting.

Evidence Level: 4B

Link: <https://bmcpyschology.biomedcentral.com/articles/10.1186/s40359-024-01545-8>

Relationship between work-family conflict and anxiety/depression among Chinese correctional officers: A moderated mediation model of burnout and resilience.

Background: Correctional officers tend to have high levels of work-family conflict (WFC). WFC has been found associated with various forms of psychological distress and to affect the overall well-being of correctional officers. Burnout and resilience may affect the relationship between WFC and psychological distress, however, this association still remains unclear. This study aimed to examine the mediating effect of burnout on the relationship between WFC and anxiety/depression and the moderating role of resilience, within the context of correctional officers. **Methods:** A cross-sectional online survey was conducted in China from October 2021 to January 2022. WFC, burnout, resilience, anxiety, and depression were evaluated using the Work-Family Conflict Scale (WFCs), Maslach Burnout Inventory-General Survey (MBI-GS), 10-item Connor-Davidson Resilience Scale (CD-RISC-10), and the Depression Anxiety Stress Scale (DASS). Mediation and moderation models were then tested using the PROCESS macro in SPSS, with burnout being a mediator and resilience playing a moderating role in the relationship between WFC and anxiety/depression. **Results:** A total of 472 correctional officers were included. Burnout was found to mediate the relationship between WFC and anxiety ($b = 0.14$, 95%CI [0.10, 0.19]) and the relationship between WFC and depression ($b = 0.23$, 95%CI [0.18, 0.28]). Additionally, resilience played a moderating role in the direct effect of WFC on anxiety ($b = -0.02$, $p < 0.01$) and the first half of the indirect effect of WFC on anxiety ($b = -0.007$, $p < 0.05$). Furthermore, resilience was also found to moderate the first half of the indirect effect of WFC on depression ($b = -0.02$, $p < 0.01$), but not the direct effect of WFC on depression ($b = -0.005$, $p > 0.05$). **Conclusion:** The findings of the present study may improve our understanding by elucidating the fundamental mechanisms of the connection between WFC and psychological distress among correctional officers. The results have significant implications for policymakers and individuals, as they suggest that diverse interventions may help promote the mental well-being of correctional officers.

Huang et al. 2024.

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

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Keywords: Burnout; correctional officer; occupational health; psychological distress; resilience; work-family conflict.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-17514-6>

Fostering Work Participation

Return to Work

Rehabilitation with intensive attention training early after acquired brain injury promotes better long-term status on health-related quality of life, daily activities, work ability and return to work.

Background: To describe long-term effects on activity, participation, and quality of life (i) at different post-injury starting time points of attention training and (ii) of two different types of rehabilitation with attention training in patients after stroke or traumatic brain injury; and to describe their functioning level. Design: 2 years after rehabilitation intervention, comparisons were made in one cohort receiving attention training subacute (< 4 months) or post-acute (4-12 months) and in one cohort with two different training methods, a process-based and an activity-based method respectively. Patients: 100 patients were recruited from our earlier RCT study. They had mild to moderate stroke or traumatic brain injury with relatively limited symptomatology, and all had moderate to severe attention impairment. **Methods:** A questionnaire-based interview: EuroQol 5 dimensions, Occupational Gaps Questionnaire, Work Ability Index, self-assessed work status, self-reported employment conditions, sick leave, and experienced cognitive limitations in work performance. **Results:** An advantage for patients receiving subacute attention training regarding daily activities, work ability and returning to work. **Conclusion:** The results indicate that subacute rehabilitation with attention training (< 4 months) is preferable compared

to post-acute intervention (4-12 months). There were only minor differences between the training methods.

Markovic et al. 2024.

Journal of Rehabilitation Medicine, vol. 56.

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Keywords: Brain injury; rehabilitation; training; quality of life; work ability; return to work.

Evidence Level: 4B

Link: <https://medicaljournalssweden.se/jrm/article/view/5308>

Presenteeism and Absenteeism

This month in Presenteeism and Absenteeism we explore issues associated with physical and mental health conditions related to employees' absenteeism, lifestyle factors associated with presenteeism and evaluation of the impact of workplace exposures on physician-certified sick leave.

Evaluation of physical and mental health conditions related to employees' absenteeism.

Background: Employees' health conditions are issues for not only employees themselves but also companies and society to keep medical costs low and productivity high. **Methods:** In this analysis, 15,574 observations from 2,319 employees at four operational sites of a large corporation were used. The dataset contained physical and mental health conditions obtained from annual mandatory medical checkups, the Brief Job Stress Questionnaire (BJSQ), and work record information. Health and other factors related to long-term absenteeism (over three days in a quarter) were analysed. Data were collected between February 2021 and January 2022, and we converted into quarterly observations. A logit (logistic regression) model was used in the analysis. **Results:** Age and gender were identified as important basic characteristics. The estimates for these variables were positive and negative and significant at the 1% level. Among the variables obtained from the medical checkups, the estimates for diastolic blood pressure, HbA1c, anamnesis, heart disease history, smoking, increased weight, and frequency of alcohol consumption were positive and significant at the 1% level, further those for taking antihypertensive medications and kidney disease history were positive and significant at the 5% level. In contrast, the estimates for systolic blood pressure and amount of alcohol consumption were negative and significant at the 1% level. The estimate for taking antihyperglycemic medications and health guidelines were negative and significant at the 5% level. Among the variables obtained from the BJSQ, the estimates for amount of work felt, fatigue and support from family and friends were positive and significant at the 1%, and the estimate for irritation was positive and significant at the 5% level. The estimates for controlling job and physical complaints were negative and significant at the 1% level, and those for usage of employee's ability to work and suitability of the work were negative and significant at the 5% level. As all four operational sites were located in the northeastern region of Japan (cold and snowy in winter), the seasonal effects were significant at the 1% level. The effect of year was also significant and significant differences were observed among the sites at the 1% level. **Conclusion:** Some physical and mental health conditions were strongly associated with long-term absenteeism. By improving these conditions, corporations could reduce the number of employee absence days. As absenteeism was costly for corporations due to replacement employees and their training costs to maintain operations, employers must be concerned about rising healthcare (direct and indirect) costs and implement investments to improve employees' health conditions. **Limitations:** This study's results were based on only one corporation and the dataset was observatory. The employees were primarily operators working inside the building and most of them are healthy. Therefore, the sample selection biases might exist, and the results cannot be generalized to other types of jobs, working conditions, or companies. As medical checkups and the BJSQ are mandatory for most companies in Japan, the framework of this study can be applied to other companies. Although we used the BJSQ results, better mental measures might exist. Similar analyses for different corporations are necessary.

Nawata 2024.

Frontiers in Public Health, vol. 11.

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Keywords: Absence days; absenteeism; job stress; medical checkups; physical and mental health.

Evidence Level: 4B

Link: <https://www.frontiersin.org/journals/public-health/articles/10.3389/fpubh.2024.1326334/full>

Lifestyle factors associated with presenteeism among city government office workers: A cross-sectional study.

Background: Presenteeism is a critical issue in occupational health. This study aimed to examine the association between presenteeism and subjective sleep quality, smoking status, and alcohol consumption.

Methods: Anonymous data of 777 workers in a Japanese city were retrospectively obtained from City Government Office A. They included variables like absolute presenteeism scores (measured using the Japanese version of the World Health Organization Health and Work Performance Questionnaire short form), gender, age, family status, subjective sleep quality, smoking status, and alcohol consumption. A binary logistic regression analysis was performed with gender, age, family status, subjective sleep quality, smoking status, and alcohol consumption as the independent variables, and absolute presenteeism scores equal to or below 40 as the dependent variable. A gender-stratified binary logistic regression analysis was also performed. **Results:** The logistic regression analysis results revealed that absolute presenteeism was positively associated with poor subjective sleep quality among all respondents (odds ratio [OR], 1.70; 95% CI, 1.18-2.44) and men (OR, 1.85; 95% CI, 1.12-3.05) and with current drinkers among women (OR, 3.49; 95% CI, 1.36-8.92); it was negatively associated with age among those who were ≥ 50 years old (OR, 0.50; 95% CI, 0.27-0.93) and with current drinkers among men (OR, 0.43; 95% CI, 0.20-0.92). **Conclusions:** The factors associated with presenteeism differed between men and women office workers, suggesting that gender differences need to be considered when working toward improving workers' productivity.

Otsubo et al. 2024.

Journal of Occupational Health, vol. 66, no. 1.

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Keywords: Alcohol consumption; office workers; presenteeism; smoking status; subjective sleep **quality**.

Evidence Level: 4B

Link: <https://academic.oup.com/joh/article/66/1/uiad012/7473691?login=true>

Comprehensive evaluation of the impact of workplace exposures on physician-certified sick leave in the general working population.

Background: Our objective was to quantify the prospective associations between work factors across chemical, physical, mechanical, and psychosocial domains and the onset of medically certified sick leave.

Methods: Eligible respondents were interviewed in 2009, 2013, or 2016 and were registered in the national sick leave register with an employee relationship lasting more than 50 working days during the year of the survey interviews and the following year ($n = 15,294$ observations). To focus on the onset of high-level sick leave (HLSL; >16 days a year), we excluded individuals with HLSL during the survey year (baseline). We then used mixed-effect logistic regression models to assess prospective associations between self-reported work conditions and the occurrence of doctor-certified HLSL in the following year.

Results: The average occurrence of HLSL was 13.1%. After adjusting for sex, age, level of education, chronic health problems, and smoking, we observed an exposure-response relationship between cumulative exposure to work factors within all domains and the occurrence of HLSL. When evaluating the impact of combined exposures, predicted odds ratios (OR) for employees exposed to 1, 2, and 3 or more work factors within all domains were 1.60 (95%CI 1.32 - 1.94), 2.56 (95%CI 1.73 - 3.74) and 4.09 (95%CI 2.28 - 7.25), compared to those not exposed. **Conclusions:** The results support the notion that exposure to multiple work factors in various domains, including psychosocial, mechanical, chemical, and physical work conditions, is associated with an increased risk of high-level sick leave. Employers and occupational health professionals should consider the joint impact of these domains when designing interventions.

Sterud et al. 2024.

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

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Keywords: Occupational exposure; occupational health; sickness absence; work; working conditions.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-17662-3>

Workers Compensation

The addition of employment support alongside psychological therapy enhances the chance of recovery for clients most at risk of poor clinical outcomes.

Background: Many people achieve positive outcomes from psychological therapies for anxiety and depression. However, not everyone benefits, and some may require additional support. Previous studies have examined the demographic and clinical characteristics of people starting treatment and identified a patient profile that is associated with poor clinical outcomes. **Aims:** To examine whether the addition of employment-related support alongside psychological therapy was associated with a greater chance of recovery for clients belonging to this patient profile. **Method:** We analysed 302 clients across three services, who were offered employment-related support alongside psychological therapy. The rate of clinical recovery (falling below clinical thresholds on measures of both anxiety and depression) was compared between individuals who accepted the offer and those who declined, while adjusting for potential confounders. **Results:** Logistic regression showed that receiving employment support was significantly associated with clinical recovery after controlling for baseline anxiety and depression scores, the number of psychological treatment sessions, and other clinical and demographic variables. The odds of recovery were 2.54 times greater if clients received employment support; 47% of clients who received employment support alongside psychological therapy were classified as recovered, compared with 27% of those receiving psychological therapy only. **Conclusions:** Providing employment support alongside therapy may be particularly helpful for clients belonging to this patient profile, who represent approximately 10% of referrals to NHS Talking Therapies for Anxiety and Depression services. Services could consider how to increase the provision and uptake of employment-focused support to enhance clients' clinical outcomes.

Thew et al. 2024.

Behavioural and Cognitive Psychotherapy, vol. 52, no. 1.

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Keywords: Employment support; IAPT; latent profile analysis; mental health outcomes; NHS talking therapies for anxiety and depression; recovery.

Evidence Level: 5B

Link: <https://www.cambridge.org/core/journals/behavioural-and-cognitive-psychotherapy/article/addition-of-employment-support-alongside-psychological-therapy-enhances-the-chance-of-recovery-for-clients-most-at-risk-of-poor-clinical-outcomes/BC6E4396526378485311138E22DEBF21>

Working hours

This month in Working Hours we explore issues associated with the association between long working hours, the use of work-related communication devices outside regular working hours, and anxiety symptoms and weekend working, nonstandard work schedules and sleep quantity and quality.

Beyond working hours: the association between long working hours, the use of work-related communication devices outside regular working hours, and anxiety symptoms.

Background: The present study aimed to identify and compare the associations between long working hours and use of work-related communication devices outside regular working hours and anxiety symptoms, thereby providing insight into redefining working hours. **Methods:** Based on the cross-sectional data from the sixth Korean Working Conditions Survey (KWCS), specifically the responses from

46 055 workers, the use of work-related communication devices outside of regular working hours, long working hours, and anxiety symptoms were assessed. To investigate the associations between using work-related communication devices outside regular working hours or long working hours with anxiety symptoms, odds ratios (ORs) and 95% CIs were calculated using multiple logistic regression models.

Results: Among 46 055 participants, 25 659 (55.7%) used work-related communication devices outside working hours, 8145 (17.7%) worked long hours, and 2664 (5.8%) experienced anxiety symptoms. Compared with the reference group, those who used work-related communication devices outside regular working hours without working long hours, had higher OR of anxiety symptoms (OR: 2.18; 95% CI, 1.97-2.41) than those who worked long hours without using work-related communication devices during off-hours (OR: 1.32; 95% CI, 1.09-1.59). Furthermore, the group that both worked long hours and used work-related communication devices outside working hours exhibited the highest OR of anxiety symptoms (OR: 2.57; 95% CI, 2.24-2.97). **Conclusions:** Using work-related communication devices outside regular working hours is associated with a higher risk of anxiety symptoms compared with long working hours. This result suggests that using work-related devices outside regular working hours, in addition to regular work time, should be considered when redefining working hours.

Kim et al. 2024.

Journal of Occupational Health, vol. 66, no. 1.

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Keywords: Anxiety; communication devices; working hours.

Evidence Level: 4B

Link: <https://academic.oup.com/joh/article/66/1/uiad004/7380778?login=true>

Work hours, weekend working, nonstandard work schedules and sleep quantity and quality: Findings from the UK household longitudinal study.

Background: Atypical temporal work patterns such as working longer than the standard 35-40 h/ week, weekend working, and nonstandard work schedules (i.e. outside of the typical 9-5, including but not restricted to shiftwork) are increasingly prevalent in the UK. Aside from occupation-specific studies, little is known about the effects of these atypical temporal work patterns on sleep among workers in the UK, even though poor sleep has been linked to adverse health problems, lower workplace productivity, and economic costs. **Method:** We used regression models to investigate associations between three types of atypical temporal work patterns (long and short weekly work hours, weekend working, and nonstandard schedules) and sleep duration and disturbance using data from over 25,000 employed men and women from 2012-2014 and/or 2015-2017 in the UK Household Longitudinal Study, adjusting for potential confounders and psychosocial work factors. **Results:** We found that relative to a standard 35-40 h/week, working 55 h/week or more was related to short sleep (less than 7 h/night) and sleep disturbance. Working most/all weekends compared to non-weekends was associated with short sleep, long sleep (more than 8 h/night), and sleep disturbance, as was working nonstandard schedules relative to standard schedules (fixed day-time schedules). Further analyses suggested some gender differences.

Conclusions: These results should prompt employers and policymakers to recognise the need for rest and recovery, consider how the timing and scheduling of work might be improved to better support workers' health and productivity, and consider appropriate compensation for anyone required to work atypical temporal work patterns.

Weston et al. 2024.

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

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Keywords: Atypical temporal work patterns; long hours; nonstandard work schedules; part-time hours; sleep disturbance; sleep duration; UK household longitudinal study; understanding society; weekend work; work hours.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-024-17762-0>

Wellness Programs

This month in Wellness Programs we explore issues associated with the perceived factors influencing blue-collar workers' participation in worksite health promotion programs and changes in pain, daily occupations, lifestyle, and health following an occupational therapy lifestyle intervention.

Perceived factors influencing blue-collar workers' participation in worksite health promotion programs in freight transport: A qualitative investigation using the TDF and COM-B.

Background: Blue-collar workers in the freight transport industry report a high risk of developing chronic diseases, partly due to an unhealthy lifestyle. Worksite health promotion programs (WHPPs) may be able to promote a healthier lifestyle, but participation among blue-collar workers in these programs is generally lower than among other workers. The current study aimed to further examine factors that can explain participation of blue-collar workers in these programs. **Methods:** A pragmatic, qualitative study was conducted, and semi-structured interviews were held with 32 blue-collar workers in freight transport in the Netherlands (94% men, 81% driver, mean age 48 (SD = 11)). The interview guide was based on the Theoretical Domains Framework (TDF) and Capability-Opportunity-Motivation-Behavior (COM-B) model and was used to assess perceived determinants that influence participation. **Results:** A combination of framework analysis and thematic analysis was conducted, which yielded the following nine main themes: (i) not being aware of WHPPs on offer, (ii) no clear picture of what to expect, (iii) (not) giving priority to health, (iv) expecting feedback and practical support, (v) being open and ready to change, (vi) preferring to be self-dependent, (vii) being offered a practical, fun and joint WHPP, (viii) having an employer who cares, thinks along and facilitates participation, and (ix) working and living in an environment in which a healthy lifestyle is not the norm. **Conclusions:** With these insights we were able to formulate recommendations to enhance the participation of blue-collar workers in WHPPs.

Damen et al. 2024.

International Journal of Environmental Research and Public Health, vol. 21, no. 1.

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Keywords: Theoretical Domains Framework; blue-collar workers; freight transport; implementation; participation; qualitative research; reach; worksite health promotion programs (WHPPs).

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/21/1/116>

Changes in pain, daily occupations, lifestyle, and health following an occupational therapy lifestyle intervention: A secondary analysis from a feasibility study in patients with chronic high-impact pain.

Background: This study explored changes in pain-related parameters, occupational function, occupational balance, lifestyle factors, and self-perceived health status in adults with chronic high-impact pain participating in an occupational therapy lifestyle intervention. **Methods:** This one-group longitudinal feasibility study was performed in three continuous feasibility rounds. The occupational therapists-led intervention targeted meaningful occupations, regular physical activity, and a healthy diet. The intervention contained individual and group sessions and was added to the standard multidisciplinary chronic pain treatment. Outpatients (n=40, 85 % females, 46.6 ± 10.9 years old) participated in the study between April 2019 and December 2021. The analysis includes data for 31 participants. Analysis of pre-post changes assessed after each feasibility round were performed for the outcomes: pain intensity, pain sensitivity and pain modulation (pressure pain threshold and tolerance, temporal summation of pain and conditioned pain modulation), pain self-efficacy, pain catastrophizing, motor and process skills, occupational balance, daily wake-time movement, daily walking steps, body mass index, waist circumference, blood pressure, and self-perceived health status. **Results:** Improvements in motor skills (assessment of motor and process skills score=0.20 (1.37; 1.57), 95 % CI 0.01; 0.38) and temporal summation of pain (-1.19 (2.86; -1.67), 95 % CI -2.16; -0.22), but a decrease in pain tolerance (-7.110 (54.42; 47.32), 95 % CI -13.99; -0.22) were observed. Correlation analysis suggested moderate-to-very strong statistically significant relationships in several outcomes related to pain, health, pain coping, occupational balance, occupational functioning, body anthropometrics, and pain sensitivity.

Conclusions: This study suggested that the lifestyle intervention would benefit motor skills while effects

on other outcomes were unclear in adults with chronic pain. To confirm the findings, a randomized trial evaluating effectiveness is needed. **Ethical committee number:** SJ-307 Reg.
Clinicaltrials.gov: [NCT03903900](https://clinicaltrials.gov/ct2/show/study/NCT03903900).

Nielsen et al. 2024.

Scandinavian Journal of Pain, vol. 24, no. 1.

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Keywords: Activities of daily living; evaluation study; health behaviour; health-related quality of life; healthy lifestyle; pain management.

Evidence Level: 3B

Link: <https://www.degruyter.com/document/doi/10.1515/sjpain-2024-0043/html>

Shift Work

This month in Shift Work we explore issues associated with the diagnosis and management of sleep disorders, the effect of oral melatonin treatment on insulin resistance and diurnal blood pressure variability, association of prolonged occupational co-exposures to electromagnetic fields, noise, and rotating shift work, associations of night shift status during pregnancy with small for gestational age and preterm births and the associations between long-term night shift work and incidence of chronic obstructive pulmonary disease.

Diagnosis and management of sleep disorders in shift workers, with patient informed solutions to improve health services research and practice.

Background: The combination of shift work and an unmanaged sleep disorder carries health and safety risks. Yet, diagnosis rates for sleep disorders are low in shift workers. The aim of this study was to understand the experience of sleep disorder diagnosis and treatment in shift workers and consider patient informed solutions to improve access to health services. **Methods:** Semi-structured interviews were conducted with 16 Australian shift workers with a diagnosed sleep disorder. Patient journey mapping and reflexive thematic analysis were used to understand diagnosis and management experiences. **Results:** There were highly variable experiences with diagnosis and management, often taking >5 years to seek help from a health care provider (HCP) after noticing symptoms of a sleep disorder. Three themes were constructed, including 'the cause of the problem', 'prioritising work', and '(dis)satisfaction and (dis)connection'. Extent of patient and HCP awareness of sleep disorders, and a prevailing attitude of shift work being 'the problem' impacted diagnosis, as did organisational needs (including rostering, which had both positive and negative influences on help seeking). Relationships with HCPs were important, and living on non-standard time was both a barrier and an enabler to sleep disorder care. Participants identified the need for education and awareness, prompts and easy access to screening and referral pathways, and tailored models of care. **Conclusion:** Education and awareness initiatives for shift workers, their employers and HCPs, together with development of a model of care for shift workers with sleep disorders may address some of the unique barriers to diagnosis and management.

Reynolds et al. 2024.

Sleep Medicine, vol. 113.

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Keywords: Health services research; occupational health; shift work schedule; sleep initiation and maintenance disorders; sleep wake disorders.

Evidence Level: 5A

Link: <https://www.sciencedirect.com/science/article/pii/S1389945723004458?via%3Dihub>

Effect of oral melatonin treatment on insulin resistance and diurnal blood pressure variability in night shift workers: A double-blind, randomized, placebo-controlled study.

Background: Night shift work is associated with sleep disturbances, obesity, and cardiometabolic diseases. Disruption of the circadian clock system has been suggested to be an independent cause of type

2 diabetes and cardiovascular disease in shift workers. We aimed to improve alignment of circadian timing with social and environmental factors with administration of melatonin. **Methods:** In a randomized, placebo-controlled, prospective study, we analysed the effects of 2 mg of sustained-release melatonin versus placebo on glucose tolerance, insulin resistance indices, sleep quality, circadian profiles of plasma melatonin and cortisol, and diurnal blood pressure profiles in 24 rotating night shift workers during 12 weeks of treatment, followed by 12 weeks of wash-out. In a novel design, the time of melatonin administration (at night or in the morning) depended upon the shift schedule. We also compared the baseline profiles of the night shift (NS) workers with 12 healthy non-night shift (NNS)-working controls. **Results:** We found significantly impaired indices of insulin resistance at baseline in NS versus NNS ($p < 0.05$), but no differences in oral glucose tolerance tests nor in the diurnal profiles of melatonin, cortisol, or blood pressure. Twelve weeks of melatonin treatment did not significantly improve insulin resistance, nor did it significantly affect diurnal blood pressure or melatonin and cortisol profiles. Melatonin administration, however, caused a significant improvement in sleep quality which was significantly impaired in NS versus NNS at baseline ($p < 0.001$). **Conclusions:** Rotating night shift work causes mild-to-moderate impairment of sleep quality and insulin resistance. Melatonin treatment at bedtime improves sleep quality, but does not significantly affect insulin resistance in rotating night shift workers after 12 weeks of administration.

Hannemann et al. 2024.

Pharmacological Research, vol. 199.

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Keywords: 24- hour blood pressure; cardiometabolic risk; circadian rhythm; diurnal rhythm; type 2 diabetes mellitus.

Evidence Level: 2A

Link: <https://www.sciencedirect.com/science/article/pii/S1043661823003675?via%3Dihub>

Association of prolonged occupational co-exposures to electromagnetic fields, noise, and rotating shift work with thyroid hormone levels.

Background: The purpose of this study was to determine the association of prolonged occupational co-exposure to extremely low-frequency electromagnetic fields (ELF-EMFs), noise, and rotating shift work with the levels of thyroid hormones (triiodothyronine (T3), thyroxine (T4), and thyroid-stimulating hormone (TSH)). **Methods:** From 2016 to 2017, we enrolled all male workers without a history of thyroid disorders and followed them until 2020. To measure ELF-EMFs and noise exposures, we calculated the 8-hour equivalent sound pressure levels (Leq) and the 8-hour average of ELF-EMFs, respectively. Shift work schedules involved 8-hr fixed day and 8-hr clockwise 3-rotating night schedules. The participant's thyroid hormone levels were obtained from blood test results in their medical records. The percentage change in the levels of T3, T4, and TSH was estimated by using different mixed-effects linear regression models.

Results: The TSH levels were significantly elevated per a 10-dB increment of noise. The levels of T4 hormone were significantly changed per a unit increase in the levels of ELF-EMFs. Compared to the fixed-day workers, we observed workers exposed to shift work had a significantly lower T4 level. For T4 and TSH hormones, we found significant interactions among noise, ELF-EMFs, and shift work variables.

Conclusions: In summary, this study warranted that prolonged exposure to ELF-EMFs, noise, and rotating shift work might be associated with thyroid dysfunction.

Khosravipour et al. 2024.

Ecotoxicology and Environmental Safety, vol. 270.

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Keywords: Electromagnetic Fields; HPT axis, endocrine disruption; noise; shift work; thyroid hormones.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0147651323013416?via%3Dihub>

Associations of night shift status during pregnancy with small for gestational age and preterm births

Background: Shift work, including night shift work, during pregnancy has been associated with adverse birth outcomes such as small for gestational age (SGA) infants and preterm births. This study, conducted in South Korea using the Korean Children's Environmental Health Study (Ko-CHENS) cohort, aimed to investigate the association between shift work and night shift status during pregnancy and adverse birth outcomes. **Methods:** The Korean Ko-CHENS is a nationwide prospective birth cohort study of children's environmental diseases, conducted by the Ministry of Environment and the National Institute of Environmental Research. This study included pregnant women recruited from 2015 to 2020 for Ko-CHENS Core Cohorts, and 4,944 out of a total of 5,213 pregnant women were selected as final subjects. A logistic regression model was used to identify the risk factors affecting SGA births, preterm births, and low-birth-weight infants, and the odds ratio (OR) was adjusted. This was confirmed by calculating ORs. Maternal age, infant sex, maternal educational status, body mass index, smoking status, alcohol consumption status, parity, gestational diabetes mellitus, preeclampsia, and abortion history were used as adjusted variables.

Results: No statistically significant differences were observed in the birth outcomes or maternal working patterns. There were no significant differences in the adjusted odds ratios (aORs) of SGA and preterm births between the non-worker, day worker, and shift worker. However, there was a significant difference in the aORs of SGA between non-workers and night shift workers. (aORs [95% confidence interval], 2.643 [1.193-5.859]). **Conclusion:** Working during pregnancy did not increase the risk of SGA or preterm birth, and night shift work did not increase the risk of preterm birth. However, night-shift work increases the risk of SGA.

Lee et al. 2024.

Journal of Korean Medical Science, vol. 39, no. 1.

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Keywords: Pregnancy; shift work schedule; small for gestational age.

Evidence Level: 4B

Link: <https://jkms.org/DOIx.php?id=10.3346/jkms.2024.39.e25>

Associations between long-term night shift work and incidence of chronic obstructive pulmonary disease: a prospective cohort study of 277,059 UK Biobank participants.

Background: Little is known about the effects of night shifts and their interactions with genetic factors on chronic obstructive pulmonary disease (COPD). In this study, we aim to investigate relationships between long-term night shift work exposure and COPD risk, and assess modification effects of genetic predisposition. **Methods:** A total of 277,059 subjects who were in paid employment or self-employed were included in the UK Biobank. Information on current and lifetime employment was obtained, and a weighted COPD-specific genetic risk score (GRS) was constructed. We used Cox proportional hazard models to investigate associations between night shift work and COPD risk, and their interaction with COPD-specific GRS. **Results:** The cohort study included 277,059 participants (133,063 men [48.03%]; mean [SD] age, 52.71 [7.08] years). During a median follow-up of 12.87 years, we documented 6558 incidents of COPD. From day work, irregular night shifts to regular night shifts, there was an increased trend in COPD incidence (P for trend < 0.001). Compared with day workers, the hazard ratio (HR) and 95% confidence interval (CI) of COPD was 1.28 (1.20, 1.37) for subjects with rarely/sometimes night shifts and 1.49 (1.35, 1.66) for those with permanent night shifts. Besides, the longer durations (especially in subjects with night shifts \geq 10 years) and increasing monthly frequency of night shifts (in workers with > 8 nights/month) were associated with a higher COPD risk. Additionally, there was an additive interaction between night shifts and genetic susceptibility on the COPD risk. Subjects with permanent night shifts and high genetic risk had the highest risk of COPD (HR: 1.90 [95% CI: 1.63, 2.22]), with day workers with low genetic risk as a reference.

Conclusions: Long-term night shift exposure is associated with a higher risk of COPD. Our findings suggest that decreasing the frequency and duration of night shifts may offer a promising approach to mitigating respiratory disease incidence in night shift workers, particularly in light of individual susceptibility.

Li et al. 2024.

BMC Medicine, vol. 22, no. 1.

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Keywords: COPD; genetic risk; night shift work; risk factor.

Evidence Level: 4B

Link: <https://bmcmmedicine.biomedcentral.com/articles/10.1186/s12916-023-03240-8>

Management and Leadership

Organisational and leadership skills towards healthy workplaces: An interview study with registered nurses in Sweden.

Background: According to shortage of registered nurses, organisational and leadership aspects grounded in person-centred approach, are highlighted to ensure high quality of care. Therefore, it is interesting to develop knowledge regarding registered nurses working environment. **Aim:** The aim of the study was to investigate registered nurses' reason to end their employment at a university hospital setting (internal medicine, emergency department). **Method:** Qualitative content analysis with an inductive methodological approach was used to analyse registered nurses' experiences regarding their former employment. Inclusion criteria: all nurses (n = 55) who ended employment during one year (first of July 2020-30th of June 2021) were invited, and 38 semi-structured interviews were conducted. **Results:** Three categories were identified: Limited organisational support, Lack of visible leadership, and Limited healthy working environment, followed by six subcategories: Longing for organisational support, Being a tile in a box, Need for professional relationship, Limitation of supportive leadership, Imbalance of work versus personal life, and Ethical stress. **Conclusion:** To improve registered nurses working environment and commitment to work, balance between time at work and personal life is significant. Therefore, organisational support and leadership skills grounded in a person-centred approach are crucial to develop a healthy working environment. A person-centred leadership could improve collaboration and shared decision-making in partnership with those involved, managers, nurses, and team members.

Rosengren et al. 2024.

BMC Nursing, vol. 23, no. 1.

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Keywords: Person-centred approach; qualitative content analysis; registered nurses; sweden; university hospital; working environment.

Evidence Level: 5B

Link: <https://bmcnurs.biomedcentral.com/articles/10.1186/s12912-024-01732-3>

Work Ability

This month in the Work Ability we explore issues associated with agent transparency, situation awareness, mental workload, and operator performance and association between health-related physical fitness indicators and working ability.

Agent transparency, situation awareness, mental workload, and operator performance: A systematic literature review.

Background. In this review, we investigate the relationship between agent transparency, Situation Awareness, mental workload, and operator performance for safety critical domains. **Background:** The advancement of highly sophisticated automation across safety critical domains poses a challenge for effective human oversight. Automation transparency is a design principle that could support humans by making the automation's inner workings observable (i.e., "seeing-into"). However, experimental support for this has not been systematically documented to date. **Method:** Based on the PRISMA method, a broad and systematic search of the literature was performed focusing on identifying empirical research investigating the effect of transparency on central Human Factors variables. **Results:** Our final sample consisted of 17 experimental studies that investigated transparency in a controlled setting. The studies

typically employed three human-automation interaction types: responding to agent-generated proposals, supervisory control of agents, and monitoring only. There is an overall trend in the data pointing towards a beneficial effect of transparency. However, the data reveals variations in Situation Awareness, mental workload, and operator performance for specific tasks, agent-types, and level of integration of transparency information in primary task displays. **Conclusion:** Our data suggests a promising effect of automation transparency on Situation Awareness and operator performance, without the cost of added mental workload, for instances where humans respond to agent-generated proposals and where humans have a supervisory role. **Application:** Strategies to improve human performance when interacting with intelligent agents should focus on allowing humans to see into its information processing stages, considering the integration of information in existing Human Machine Interface solutions.

van de Merwe et al. 2024.

Human Factors, vol. 66, no. 1.

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Keywords: PRISMA; automation transparency; human-automation interaction; information disclosure; seeing into.

Evidence Level: 1A

Link: <https://journals.sagepub.com/doi/full/10.1177/00187208221077804>

Association between health-related physical fitness indicators and working ability: A systematic review.

Background: Work ability (WA) reflects a balance between work demands and an individual's ability to meet them. It is influenced by several occupational and health-related factors including the individual's physical fitness (PF). Therefore, the aim of the present study was to provide an overview of the possible relationship between PF measures and the individual's WA. **Methods:** A systematic review of studies published up to December 1, 2022 and available in PubMed, Scopus, and ISI Web of Science databases, was performed. Results have been summarized according to the specific PF parameter explored.

Results: The 14 reviewed studies, enrolling 47 to 1005 workers, all showed a satisfactory methodological quality. Some positive evidence emerged for a possible association between changes in aerobic capacity, walking speed, balance, flexibility, muscle strength, and WA perception. However, the limited number of studies, their cross-sectional design, the different PF performance indicators, populations, and job tasks explored prevented definite conclusions. **Conclusions:** Future longitudinal studies should be planned to confirm such positive results and identify PF indicators better predictive for changes in the WA of employees engaged in specific job tasks, particularly in physically demanding activities. This may be helpful to include PF performance tests in occupational health practice as an integrated part of risk assessment and management strategies as well as in health and well-being promotion plans.

Leso et al. 2024.

Journal of Occupational Health, vol. 66, no. 1.

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Keywords: Health promotion; muscle strength; physical performance; risk assessment and management; work capacity; work productivity.

Evidence Level: 1A

Link: <https://academic.oup.com/joh/article/66/1/uiad006/7380779?login=true>

Adapting to the Future of Work

Aging Workforce

This month in the Aging Workforce we explore issues associated with work engagement in older workers and the effect of the Covid-19 lockdown on retirement in middle-aged and older people.

Why did middle-aged and older people retire since the first COVID-19 lockdown? A qualitative study of participants from the Health and Employment After Fifty study.

Background: Governments of Western countries need people to work to older ages, however the COVID-19 pandemic impacted the workforce by pushing older adults to retire. Socio-demographic factors that influence the decision to retire in the pre-pandemic period were, poor or good health, finances, marital status, and gender. The aim of this study was to explore aspects that contributed to the decision to retire among middle-aged and older people in England who retired during the COVID-19 pandemic. **Methods:** In September 2022 semi-structured interviews were conducted with a sample of participants from the Health and Employment After Fifty (HEAF) study who retired since March 2020. Consenting participants were purposively selected to achieve a wide spread of characteristics deemed important in the retirement process. Telephone interviews were conducted, audio-recorded, transcribed and then thematically analysed. **Results:** 24 interviews were conducted (10 men and 14 women, mean age 65 years). Six themes were identified: four of them were non-COVID-19 aspects while two can be interpreted as impact of COVID-19 on the workforce. Work-related factors were of major importance. A sense of appreciation and attachment in relation to their employer, and conversely high work demands and stress, as well as changes in work responsibilities and work practices since lockdown and/or perception of personal safety in the workplace during the pandemic influenced their retirement decision, as did physical and mental health issues. Another theme suggested that some participants felt they had reached the 'right' age and needed to spend more time with family. Having the financial capacity to retire was widely mentioned but was never the main factor. **Conclusions:** The decision to retire during the pandemic was multi-factorial although changes to work during lockdown were of great importance. Post-pandemic, our findings suggest that there are modifiable aspects of work, including appreciation and fair pay and work conditions, that employers and policy makers could encourage to retain their older workers.

D'Angelo et al. 2024.

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

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Keywords: Ageing; Covid-19 pandemic; qualitative study; retirement; thematic analysis.

Evidence Level: 5B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-023-17548-w>

Work engagement among older workers: A systematic review.

Background: Given current labor force conditions, including population aging, keeping older workers engaged in work and motivated is important. Aging may alter the effects that psychological and environmental factors have on work engagement. We conducted a systematic review to understand the features of work engagement among older workers. **Methods:** A systematic search was conducted in July 2022 using 4 databases. The review included relevant articles that focused on participants aged 40 years and older. **Results:** Fifty articles were selected for our review, which were grouped into 5 categories: (1) studies examining the relationship between chronological age and work engagement, (2) studies investigating the moderating effects of age on the relationship between job-related psychological factors and work environment factors and work engagement, (3) studies comparing the relationship of job-related psychological factors and work environment factors with work engagement across different age groups, (4) studies exploring the relationship between work engagement and retirement intentions or continued employment beyond retirement age, and (5) other studies discussing work engagement in the context of older workers. Most articles focused on workers in Europe and the United States and used observational study designs. **Conclusions:** Work engagement increases with age and is mainly mediated by increased emotional regulation. In addition, age moderates the relationships between various job-

related psychological and work-environmental factors and work engagement. Work engagement is associated with working beyond retirement age. Organizations should understand the characteristics of work engagement among older workers and make age-conscious efforts to support them in adapting to social changes.

Mori et al. 2024.

Journal of Occupational Health, vol. 66, no. 1.

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Keywords: Age; job-demand control model; lifespan developmental psychology; older worker; prolonging retirement; work engagement.

Evidence Level: 1A

Link: <https://academic.oup.com/joh/article/66/1/uiad008/7442061?login=true>

Work Environment

This month in the Work Environment we explore issues associated with working from home and the relationship between the telecommuting environment and somatic symptoms.

Experiences of working from home: Umbrella review.

Background: The concept of "working from home" is extremely topical following the COVID-19 pandemic; therefore, it is unsurprising that there has been an increased interest in collating research related to homeworking. This has been carried out by multiple reviews, all with slightly different research aims and methodologies. Collating the findings from the available reviews is therefore highly beneficial to establish the experience of homeworking to create recommendations for the future of home-based work.

Methods: An umbrella review was carried out. In June 2022, literature searches were conducted across 4 electronic databases. Published reviews of literature that used a systematic process, were focused on working from home populations, and detailed factors that could be related to the personal experience of homeworking (eg, barriers, facilitators, advantages, disadvantages) were included. **Results:** A total of 1930 records were screened, and 6 review articles were included. Results report on the following sections: working environment (eg, workplace design, space conditions), personal impact (eg, satisfaction, career impact), and health (eg, physical health, well-being) including a total of 19 themes. Mixed findings were apparent for nearly all included themes, highlighting the need to consider individual and contextual circumstances when researching working from home. **Conclusions:** This review establishes the importance of retaining flexibility while homeworking for employees, managers, and organizations. Essentially, a one-size-fits-all approach to working from home is impractical as individual circumstances limit application. Eight recommendations for the future of working from home are suggested.

Hall et al. 2024.

Journal of Occupational Health, vol. 66, no. 1.

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Keywords: WFH; experience of homeworking; umbrella review; working from home.

Evidence Level: 1A

Link: <https://academic.oup.com/joh/article/66/1/uiad013/7473692?login=true>

Association between the telecommuting environment and somatic symptoms among teleworkers in Japan.

Background: This study aimed to clarify the association between telecommuting environments and somatic symptoms among teleworkers in Japan. **Methods:** This cross-sectional study, conducted from September 27 to October 29, 2021, used data from the Japan COVID-19 and Society Internet Survey (JACSIS study) in Japan. Of the 31 000 male and female respondents, who were Japanese residents aged 15-79 years and were randomly selected from the panel members of an internet survey company, 4569 home-based teleworkers were finally included in the analysis; 26 431 respondents who met the exclusion

criteria were excluded. The analysis included 4 cut-offs (≥ 4 , 8, 12, and 16 points) for somatic symptoms on the Somatic Symptom Scale-8 as objective variables, and the telecommuting environment, such as having adequate desk light and a quiet environment, as explanatory variables. Adjusted Poisson regression analysis was conducted using demographic variables as covariates. **Results:** The prevalence ratio (PR) for somatic symptoms increased significantly as the number of poor telecommuting conditions increased, regardless of the cut-off value for somatic symptoms or the frequency of teleworking. In the telecommuting environment, the PR for somatic symptoms was significantly higher for the following 6 items: poor teleworking space to concentrate, inadequate foot space, poor communication environment, poor space for relaxation, noise, and inappropriate temperature and humidity. **Conclusions:** These results suggest that for home-based teleworkers, the more inadequate the telecommuting environment, especially in the aforementioned 6 areas, the higher the likelihood of somatic symptoms. Improving these environments may be useful in preventing various somatic symptoms.

Kanamori et al. 2024.

Journal of Occupational Health, vol. 66, no. 1.

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Keywords: Home environment; occupational health; somatic symptoms; teleworking.

Evidence Level: 4B

Link: <https://academic.oup.com/joh/article/66/1/uiad014/7479887?login=true>