



Australian Government

Comcare

Emerging Evidence Alert

August 2022

This Emerging Evidence Alert 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. It provides a review of recent journal articles and relevant content related to Comcare's five research themes: Fostering Work Participation; Building Employer Capability; Adapting to the Future of Work; Guiding and Supporting Mental Health and Wellbeing; and Enabling Healthy and Safe Workplaces. Collated articles were published in July 2022 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

Fostering Work Participation

Return to Work

This month we explore issues associated with the return to work for workers following a mild traumatic brain injury, concussion and stress-related disorders.

Return to work after mild traumatic brain injury: Association with positive CT and MRI findings

Background: Return to work (RTW) might be delayed in patients with complicated mild traumatic brain injury (MTBI), i.e., MTBI patients with associated traumatic intracranial lesions. However, the effect of different types of lesions on RTW has not studied before. We investigated whether traumatic intracranial lesions detected by CT and MRI are associated with return to work and post-concussion symptoms in patients with MTBI. **Methods:** We prospectively followed up 113 adult patients with MTBI that underwent a brain MRI within 3-17 days after injury. Return to work was assessed with one-day accuracy up to one year after injury. Rivermead Post-Concussion Symptoms Questionnaire (RPQ) and Glasgow Outcome Scale Extended (GOS-E) were conducted one month after injury. A Kaplan-Meier log-rank analysis was performed to analyze the differences in RTW. **Results:** Full RTW-% one year after injury was 98%. There were 38 patients with complicated MTBI, who had delayed median RTW compared to uncomplicated MTBI group (17 vs. 6 days), and more post-concussion symptoms (median RPQ 12.0 vs. 6.5). Further, RTW was more delayed in patients with multiple types of traumatic intracranial lesions visible in MRI (31 days, n = 19) and when lesions were detected in the primary CT (31 days, n = 24). There were no significant differences in GOS-E. **Conclusions:** The imaging results that were most clearly associated with delayed RTW were positive primary CT and multiple types of lesions in MRI. RTW-% of patients with MTBI was excellent and a single intracranial lesion does not seem to be a predictive factor of disability to work.

Huovinen et al. 2022.

Acta Neurochirurgica, vol. 164, no. 7.

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Keywords: Functional recovery; mild traumatic brain injury; post-concussion symptoms; return to work; traumatic intracranial lesions.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007/s00701-022-05244-4>

Outlining the invisible: Experiences and perspectives regarding concussion recovery, return-to-work, and resource gaps

Background: Appropriate supports and accommodations are necessary to ensure full concussion recovery and return-to-work (RTW). **Methods:** This research investigated barriers and facilitators to concussion recovery and RTW, and resource gaps reported by adults with concussion ('workers') and workplace and healthcare professionals ('workplaces'). Semi-structured interviews and focus groups were conducted with workers (n = 31) and workplaces (n = 16) across British Columbia. Data were analyzed using inductive content analysis. **Results:** Facilitators to workers' concussion recovery and RTW included treatment, social support, and workplace and lifestyle modifications. To address barriers, both groups recommended: (a) widespread concussion and RTW education and training (b) standardized concussion recovery guidelines; (c) changing attitudes toward concussion; (d) mental health supports; and (e) increasing awareness that every concussion is unique. **Conclusion:** Findings can inform best practice for concussion recovery and RTW among professionals in workplaces, healthcare, occupational health and safety, and workers' compensation boards.

Karmali et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 15.

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Keywords: Adult; concussion management; concussion recovery; mild traumatic brain injury; occupational health; workers; workplace.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/13/8204>

Integrating vocational rehabilitation and mental healthcare to improve the return-to-work process for people on sick leave with stress-related disorders: Results from a randomized trial

Background: Stress-related disorders are common, associated with substantial individual suffering, and place a large economic burden on society. While treatment appears to be able to reduce symptoms, evidence of interventions to improve vocational outcomes is flimsy. Lack of integration of vocational rehabilitation and healthcare services has been suspected to be a major potential barrier in return-to-work (RTW) processes; therefore, we aimed to test the effectiveness of such integration. **Methods:** We randomized participants who were on sick leave for ≥ 4 weeks with a stress-related disorder. They were allocated to (i) service as usual (SAU), (ii) improved mental healthcare (MHC), or (iii) integrated interventions (INT). The primary outcome was RTW rates measured at 12 months. Secondary outcome were RTW rates measured at 6 months, proportion in work at 12 months, and levels of stress, anxiety, depression, and functioning at 6 months. **Results:** We included 666 participants. On the primary outcome and almost all other vocational outcomes, SAU was superior to both INT and MHC. MHC and INT did not differ on any vocational outcome. On several symptom scales, MHC showed lower values than SAU, whilst INT did not differ from the two other groups. **Conclusion:** Both the INT and the MHC intervention lowered RTW rates compared with SAU, and thereby yielded a worse outcome. However, the MHC group showed a tendency towards having lower symptom levels compared with those in the SAU group; accordingly, the SAU group is not unequivocally superior. MHC and INT showed no general differences.

Hoff et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 48, no. 5.

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Keywords: Vocational rehabilitation; sick leave; mental health; return to work; stress; stress-related disorders.

Evidence Level: 2A

Link: <https://www.sjweh.fi/article/4021>

Presenteeism and Absenteeism

This month we explore sick leave absenteeism amongst workers with hearing loss or musculoskeletal disorders and the types of follow-up regimes for sick-listed employees across a number of European countries.

Hearing loss, sick leave, and disability pension: Findings from the HUNT follow-up study

Background: Evidence on the association between hearing loss and sick leave or disability pension is to a great extent based on few cross-sectional studies and remains unclear. We aim to assess the associations in a long-term follow-up population study. **Methods:** We used baseline data from a large population-based hearing study in Norway, the HUNT Hearing study (1996-1998). The sample included 21 754 adults (48.5% men, mean age at baseline 36.6 years). We used register data on sick leave and disability pension (1996-2011). Cox regression was used to assess the association between hearing loss at baseline (Pure tone average/PTA 0.5-4 kHz > 20 dB) and time to first physician-certified sick leave episode, as well as time to first disability pension payment. **Results:** Hearing loss at baseline (yes/no) was weakly associated with time to first physician-certified sick leave episode: Hazard ratio (HR) 1.2 (95% confidence interval (CI) 1.1-1.3). Restricting the exposed group to people with both hearing loss and tinnitus, the HR was slightly increased: 1.3 (95% CI 1.1-1.6). Hearing loss in 1996-1998 was also associated with time to first received disability pension: HR 1.5 (95% CI 1.3-1.8). Stronger associations were found for disabling hearing loss (PTA > 35). Restricting the exposure to hearing loss and tinnitus, the HR was increased: 2.0 (95% CI 1.4-2.8). **Conclusions:** This large population-based cohort study indicates that hearing loss is associated with increased risk of receiving disability pension, especially among younger adults and low educated workers. Hearing loss was weakly associated with sick leave.

Jørgensen et al. 2022.

BMC Public Health, vol. 22, no. 1.

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Keywords: Disability pension; hearing loss; sick leave.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13760-2>

A grounded theory study on the intention to work while ill among workers with musculoskeletal disorders: An in-depth understanding of workers' experiences

Background: Frequent short-term sickness absence is prevalent among workers with musculoskeletal disorders (MSDs). This in return leads to poor productivity in organizations and decreased ability to work among workers. Nevertheless, some workers with MSDs still continue to work despite pain and are able to maintain their productivity. Existing literature on attending work while ill is very limited. Understanding the factors influencing workers' attendance to work while having symptoms is crucial to help workers live with their MSD productively and healthily. According to literature on behavior theories, the proximal determinant of behavior is one's intention to engage in that behavior. Thus, this study was conducted to explore the factors that influence the intention to work while ill among workers with MSD. **Methods:** Twenty-one in-depth interviews were conducted using a semi-structured guide according to a grounded theory approach. Workers with MSD were recruited via a purposive and snowballing sampling until data saturation was attained. Data were analyzed by means of thematic analysis using computer software, ATLAS.ti. **Results:** Nine major significant themes of factors influencing the intention to work while ill were identified after transcription. From these, a total of six themes were associated with attendance incentives driving workers to attend work while ill (work commitment, work satisfaction, support from colleagues, workplace arrangements, ability to recover at home and ability to manage pain at work) and three themes were linked to attendance requirements (consequences to self, consequences to others and poor acceptance of one's illness for sickness absence by supervisor and colleagues) faced by workers to attend work while ill. **Conclusions:** This study underlines the importance of both positive and negative motivators in influencing the intention to work while ill among workers with MSD. Future research suggests comparing both motivators in terms of work performance to aid more workers to work while ill.

Yusoff et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: Grounded theory; intention; musculoskeletal diseases; workers.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/14/8700>

Follow-up regimes for sick-listed employees: A comparison of nine north-western European countries

Background: The Covid-19 pandemic has revealed the importance of social protection systems, including income security, when health problems arise. **Methods:** The aims of this study are to compare the follow-up regimes for sick-listed employees across nine European countries, and to conduct a qualitative assessment of the differences with respect to burden and responsibility sharing between the social protection system, employers and employees. **Results:** The tendency highlighted is that countries with shorter employer periods of sick-pay typically have stricter follow-up responsibility for employers because, in practice, they become gatekeepers of the public sickness benefit scheme. In Germany and the UK, employers have few requirements for follow-up compared with the Nordic countries because they bear most of the costs of sickness absence themselves. The same applies in Iceland, where employers carry most of the costs and have no obligation to follow up sick-listed employees. The situation in the Netherlands is paradoxical: employers have strict obligations in the follow-up regime even though they cover all the costs of the sick-leave themselves. **Conclusion:** During the pandemic, the majority of countries have adjusted their sick-pay system and increased coverage to reduce the risk of spreading Covid-19 because employees are going to work sick or when they should self-quarantine, except for the Netherlands and Belgium, which considered that the current schemes were already sufficient to reduce that risk.

Ose et al. 2022.

Health Policy, vol. 126, no. 7.

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Keywords: European countries; comparative study; sick-pay; sickness absenteeism; sickness benefit.

Evidence Level: 4A

Link: <https://www.sciencedirect.com/science/article/pii/S016885102200104X?via%3Dihub>

Building Employer Capability

Wellness Programs

This month we explore the use of a user centred design approach for an online, peer-led workplace health promotion initiative and the effectiveness of a structured health intervention for truckers (SHIFT).

Applying a user centred design approach to optimise a workplace initiative for wide-scale implementation

Background: Translation of an effective research intervention into a program able to be implemented in practice typically requires adaptations to ensure the outcomes can be achieved within the applied setting. User centred design (UCD) methodologies can support these iterative adaptations, with this approach being particularly well suited to peer-led interventions, due to a focus on usability. **Methods:** We describe and reflect on the UCD approach that was applied to optimise an online, peer-led workplace health promotion initiative (BeUpstanding: ACTRN12617000682347) to be suitable for wide-scale implementation and evaluation. **Results:** Optimisation was aligned against the indicators of the RE-AIM (reach, effectiveness, adoption, implementation, maintenance) framework, with UCD methodologies (discovery interviews, persona and scenario mapping, facilitated workshops, surveys and prototyping) employed to enhance the program according to all RE-AIM dimensions. The core team (content experts, implementation scientist, interaction designer, software developer, business developer) worked closely with policy and practice partners and end users (workplace champions, management and staff) to iteratively develop and test across the RE-AIM indicators. **Conclusion:** This description and reflection of the process of applying UCD and the RE-AIM framework to the optimisation of BeUpstanding is intended to provide guidance for other behaviour change research adaptations into practice.

Goode et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 13.

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Keywords: RE-AIM; behaviour change; champion; health promotion; implementation; peer-led; sedentary; user centred design; workplace.

Evidence Level: 6B

Link: <https://www.mdpi.com/1660-4601/19/13/8096>

The structured health intervention for truckers (SHIFT) cluster randomised controlled trial: A mixed methods process evaluation

Background: This paper presents the mixed methods process evaluation of the randomised controlled trial (RCT) of the Structured Health Intervention For Truckers (SHIFT), a multi-component intervention targeting physical activity and positive lifestyle behaviours in a cohort of 382 truck drivers in the UK. The SHIFT RCT found a significant difference in daily steps between intervention and control groups at 6-months in favour of the intervention participants. **Methods:** SHIFT was evaluated within a cluster-RCT and involved 25 transport sites (12 intervention and 13 control sites). Intervention components included an education session, Fitbit, text messages, and cab workout equipment. Participants completed questionnaires at baseline and 6-months follow-up. Semi-structured focus groups/interviews were conducted with drivers (n = 19) and managers (n = 18) from each site, after completion of the final follow-up health assessment (16-18 months post-randomisation). Questionnaires and interviews collected information on fidelity, dose, context, implementation, barriers, sustainability, and contamination. **Results:** Questionnaire and interview data from intervention participants indicated favourable attitudes towards SHIFT, specifically towards the Fitbit with a high proportion of drivers reporting regularly using it (89.1%). 79.2% of intervention

participants attended the education session, which was deemed useful for facilitating improvements in knowledge and behaviour change, dietary changes were predominantly recalled. Despite not being part of the intervention, participants reported that feedback from the health assessments motivated them to change aspects of their lifestyle (intervention = 91.1%, control = 67.5%). The cab workout equipment was used less and spoken unfavourably of in the interviews. The main barriers to a healthy lifestyle at work were reported as long hours and irregular shift patterns. The most suggested improvement for the intervention was more frequent contact with drivers. Managers were positive about the objectives of SHIFT, however almost all mentioned the challenges related to implementation, specifically in smaller sites. **Conclusions:** Overall, SHIFT was predominantly implemented as intended, with minimal discrepancies seen between the delivery and protocol. Having said this, transport sites each have distinct characteristics, which may require adaptations to individual settings to encourage participation. Managers and drivers reported enthusiasm and necessity for SHIFT to be included in future Certificate of Professional Competence training.

Guest et al. 2022.

International Journal of Behavioral Nutrition and Physical Activity, vol. 19, no. 1.

User License: *Creative Commons Attribution (CC BY 4.0)* (<https://creativecommons.org/licenses/by/4.0/>)

Keywords: Behaviour change; dietary behaviours; healthy lifestyle; occupational health; physical activity; process evaluation; sedentary behaviour; truck drivers; workplace.

Evidence Level: 2A

Link: <https://ijbnpa.biomedcentral.com/articles/10.1186/s12966-022-01316-x>

Job Design

This month we explore the effort-reward imbalance in workers and the effect of tele-working on work-life balance during the COVID-19 pandemic.

The evolution of effort-reward imbalance in workers during the COVID-19 pandemic in France - An observational study in more than 8000 workers

Background: The effects of lockdown repetition on work-related stress, expressed through Effort-Reward Imbalance (ERI), during the COVID-19 pandemic are poorly documented. We investigated the effect of repetitive lockdowns on the ERI in French workers, its difference across occupations, and the change in its influencing factors across time. **Methods:** Participants were included in a prospective cross-sectional observational study from 30 March 2020 to 28 May 2021. The primary outcome was the ERI score (visual analog scale). The ERI score of the population was examined via Generalized Estimating Equations. For each period, the factors influencing ERI were studied by multivariate linear regression. **Results:** In 8121 participants, the ERI score decreased in the first 2 lockdowns (53.2 ± 0.3 , $p < 0.001$; 50.5 ± 0.7 , $p < 0.001$) and after lockdown 2 (54.8 ± 0.8 , $p = 0.004$) compared with the pre-pandemic period (59 ± 0.4). ERI was higher in medical than in paramedical professionals in the pre-pandemic and the first 2 lockdowns. Higher workloads were associated with better ERI scores. **Conclusions:** In a large French sample, Effort-Reward Imbalance worsened during the COVID-19 pandemic until the end of the 2nd lockdown. Paramedical professionals experienced a higher burden of stress compared with medical professionals.

Delamarre et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 15.

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Keywords: France; Sars-CoV-2; Siegrist's framework; lockdowns; work-related stress.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/15/9113>

Work-life balance and teleworking: Lessons learned during the pandemic on gender role transformation and self-reported well-being

Background: Lockdown during COVID-19 forced the emergence of a new scenario, with men and women teleworkers spending all their time at home. **Methods:** The purpose of this study is to address whether this

situation has triggered a transformation in gender roles and self-reported well-being, comparing the responses of male and female respondents to the EUROFOUND April to July 2020 survey. The analysis addresses cultural differences across European regions related to diverse gender regimes, employment status, and the possibility of teleworking. It explores male and female well-being through life satisfaction, the distance between happiness and life satisfaction, and rates their feelings about work-life balance.

Results: Findings on life satisfaction display a low transformation of social roles, with women still worrying about work-life balance, while men were more affected by the health crisis. Men self-report high life satisfaction across Europe compared to women, although unexpectedly, female freelancers in Northern and Southern European had a higher life satisfaction ratio than men. Both men and women teleworkers reported difficulties with managing work-life balance at home, despite women handling core care and household tasks. **Conclusion:** These findings suggest that women would have received more support from men, as they worked harder and longer hours during the lockdown, despite their weak position in the labor market. This would seem to be a propitious setting for men to have assumed more responsibility at home, resulting in a more equal distribution of roles at home.

González Ramos et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: COVID-19 pandemic; feelings about work-life balance; gender regime; gender role distribution; life satisfaction; teleworking; well-being.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/14/8468>

Shift Work

This month we explore the relationship between shift work and incident stroke parameters, the rate of humoral response following vaccination, circadian and sleep health, sickness absence and workers serum vitamin D levels.

Interaction of night shift work with polymorphism in melatonin receptor 1B gene on incident stroke

Background: The aim of this study was to investigate whether melatonin receptor type 1B (MTNR1B) rs10830963 polymorphism interacts with night shift work on the risk of incident stroke. **Methods:** This study included individuals free of stroke at baseline from the UK Biobank. Night-shift work was assessed by the self-reported questions. MTNR1B rs10830963 was directly genotyped (CC, GC, and GG). Incident stroke was ascertained through hospital records and death registries. Cox proportional hazards models were employed to examine the associations of night shift work and MTNR1B rs10830963 with the risk of incident stroke. **Results:** A total of 242 194 participants were finally included (mean age: 52.95 years; 51.63% women). Over 12-year follow-up, 3287 incident stroke events occurred. Night shift work increased the risk of incident stroke [hazard ratio (HR) 1.13, 95% confidence interval (CI) 1.00-1.28] after adjusting for socio-demographics, and this association attenuated after additional adjustment for lifestyle factors (HR 1.06, 95% CI 0.94-1.20). MTNR1B rs10830963 polymorphism modified the association between night shift work and incident stroke (P for interaction = 0.010). In the Cox models adjusted for socio-demographics and lifestyle factors, among night-shift workers, minor allele G was associated with a reduced risk of incident stroke (GC versus CC, HR 0.74, 95% CI 0.58-0.95; GG versus CC, HR 0.65, 95% CI 0.40-1.06; P for trend = 0.010); while night shift work was associated with a higher stroke risk only among MTNR1B rs10830963 CC carriers (HR 1.23, 95% CI 1.05-1.44) but not GC/GG carriers. **Conclusions:** These results suggest that MTNR1B rs10830963 may potentially modify the associations between night shift work and incident stroke.

Chen et al. 2022

Scandinavian Journal of Work, Environment and Health, vol. 48, no. 5.

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Keywords: Night shift; melatonin; stroke.

Evidence Level: 4B

Link: <https://www.sjweh.fi/article/4025>

Digital circadian and sleep health in individual hospital shift workers: A cross sectional telemonitoring study

Background: Telemonitoring of circadian and sleep cycles could identify shift workers at increased risk of poor health, including cancer and cardiovascular diseases, thus supporting personalized prevention.

Methods: The Circadian cross-sectional study aimed at determining early warning signals of risk of health alteration in hospital nightshifters (NS) versus dayshifters (DS, alternating morning and afternoon shifts). Circadian rhythmicity in activity, sleep, and temperature was telemonitored on work and free days for one week. Participants wore a bluetooth low energy thoracic accelerometry and temperature sensor that was wirelessly connected to a GPRS gateway and a health data hub server. Hidden Markov modelling of activity quantified Rhythm Index, rest quality (probability, p1-1, of remaining at rest), and rest duration. Spectral analyses determined periods in body surface temperature and accelerometry. Parameters were compared and predictors of circadian and sleep disruption were identified by multivariate analyses using information criteria-based model selection. Clusters of individual shift work response profiles were recognized.

Findings: Of 140 per-protocol participants (133 females), there were 63 NS and 77 DS. Both groups had similar median rest amount, yet NS had significantly worse median rest-activity Rhythm Index (0.38 [IQR, 0.29-0.47] vs. 0.69 [0.60-0.77], $p < 0.0001$) and rest quality p1-1 (0.94 [0.94-0.95] vs 0.96 [0.94-0.97], $p < 0.0001$) over the whole study week. Only 48% of the NS displayed a circadian period in temperature, as compared to 70% of the DS ($p = 0.026$). Poor p1-1 was associated with nightshift work on both work ($p < 0.0001$) and free days ($p = 0.0098$). The number of years of past night work exposure predicted poor rest-activity Rhythm Index jointly with shift type, age and chronotype on workdays ($p = 0.0074$), and singly on free days ($p = 0.0005$). **Interpretation:** A dedicated analysis toolbox of streamed data from a wearable device identified circadian and sleep rhythm markers, that constitute surrogate candidate endpoints of poor health risk in shift-workers.

Zhang et al. 2022.

EBioMedicine, vol. 81.

User License: Creative Commons Attribution (CC BY 4.0) (<https://creativecommons.org/licenses/by/4.0/>)

Keywords: Body temperature; circadian rhythm; rest-activity; shift work; sleep; telemonitoring.

Evidence Level: 4B

Link: [https://www.thelancet.com/journals/ebiom/article/PIIS2352-3964\(22\)00302-4/fulltext](https://www.thelancet.com/journals/ebiom/article/PIIS2352-3964(22)00302-4/fulltext)

Does knowledge of sleep hygiene recommendations match behaviour in Australian shift workers? A cross-sectional study

Background: Shiftworkers routinely obtain inadequate sleep, which has major health consequences. Sleep hygiene describes a range of behaviours, lifestyle and environmental factors that can improve sleep. To date, limited research has examined sleep hygiene in shiftworkers. This study aimed to assess the sociodemographic and behavioural correlates of sleep hygiene knowledge and engagement with sleep hygiene practices in Australian shiftworkers. **Study design:** An online, cross-sectional survey.

Setting and participants: Australian adults from across multiple industries (n=588) who work shift work.

Measures: The online survey included questions regarding sleep hygiene knowledge and questions from modified versions of the Pittsburgh Sleep Quality Index and Sleep Hygiene Index. **Results:** Of the 588 participants, 52.9% reported having heard of 'sleep hygiene'. Of these participants, 77.5% reported understanding the term moderately, extremely or very well. Engagement with each sleep hygiene practice was varied. Common sleep hygiene practices were controlling the bedroom environment (eg, a cool, dark and quiet bedroom). Less common practices were avoiding light as bedtime approaches. Logistic regressions revealed that shiftworkers who had heard of sleep hygiene were more likely to engage in sleep hygiene practices and had better sleep quality compared with those who had not heard of sleep hygiene. Increased engagement in sleep hygiene practices did not predict the likelihood of individuals reporting better sleep quality. **Conclusions:** Shiftworkers demonstrated varied knowledge, understanding and engagement with individual sleep hygiene practices. Future research should focus on the development of sleep hygiene interventions that accommodate the unique challenges of shift work to optimise sleep.

Rampling et al. 2022.

BMJ Open, vol. 12, no. 7.

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Keywords: Health policy; occupational & industrial medicine; public health; sleep medicine.

Evidence Level: 4A

Link: <https://bmjopen.bmj.com/content/12/7/e059677.long>

Night shift work is associated with reduced rate of humoral response following vaccination for HBV

Background: Night shift work has been associated with cardiovascular and metabolic disease, endocrine and immunological disorders. Published studies have reported that a reduced total sleep time with sleep-wake cycle alterations were associated with a reduced rate of humoral response following vaccination.

Methods: Our study aimed to evaluate the association between night shift work and serological status for HBV among workers employed in a university hospital in Rome. We evaluated medical records of 986 HCWs working at Tor Vergata Policlinic of Rome. We screened all study subjects for anti-HBs IgG, anti-HBc IgG and HBsAg. Serological protection for HBV was evaluated in relation to sex, age group, job task, risk setting and night shift work status. **Results:** Protective titer was found in 856 (86.8%) study participants and the mean titer was significantly high in females, in subjects aged less than 40 years, in night shift workers and in high-risk setting workers. After adjustment for study covariates, night shift work was no longer associated with an HBV-protective titer. **Conclusion:** This finding suggests that a vaccination strategy for dampening HBV transmission should be carefully addressed in health care workers (HCWs) doing night shift.

Coppeta et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: HBV; healthcare workers; immunological memory; night shift; shift work; vaccination.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/14/8834>

A longitudinal study on trajectories of night work and sickness absence among hospital employees

Background and methods: This study aimed to investigate trajectories of night shift work in irregular shift work across a 12-year follow-up among hospital employees with and without sickness absence (SA). The payroll-based register data of one hospital district in Finland included objective working hours and SA from 2008 to 2019. The number of night shifts per year was used in group-based trajectory modeling (GBTM).

Results: The results indicate that, among those who had any sickness absence episodes, the amount of night work decreased prior to the first SA. In general, trajectories of night shift work varied from stably high to low-but-increasing trajectories in terms of the number of shifts. However, a group with decreasing pattern of night work was identified only among those with sickness absence episodes but not among those without such episodes. **Conclusion:** To conclude, the identified trajectories of night work with or without sickness absences may indicate that, among those with sickness absence episodes, night work was reduced due to increasing health problems. Hence, the hospital employees working night shifts are likely a selected population because the employees who work at night are supposed to be healthier than those not opting for night work.

Krutova et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 13.

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Keywords: Employees; health care; longitudinal; night shift work; sickness absence; trajectory analysis.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/13/8168>

Shift work and Serum Vitamin D levels: A systematic review and meta-analysis

Background: Vitamin D deficiency and insufficiency are highly prevalent conditions worldwide due to several factors, including poor sun exposure. Shift workers may be exposed to the risk of hypovitaminosis D due to fewer opportunities for sunlight exposure compared to day workers. **Methods:** A systematic review of the PubMed, SCOPUS, and EMBASE databases was conducted according to the Preferred Reporting

Items for Systemic Reviews and Meta-Analyses (PRISMA) statement to investigate the effect of shift work on vitamin D levels. Mean differences (MD) and 95% confidence intervals (CI) of serum 25-OH-D levels in shift workers and non-shift workers were calculated. **Results:** A total of 13 cross-sectional studies were included in the meta-analysis. We found significantly lower levels of serum 25-OH-D in shift workers compared with non-shift workers (MD: -1.85, 95% CI [-2.49 to -1.21]). Heterogeneity among included studies was high ($I^2 = 89\%$, $p < 0.0001$), and neither subgroup analysis nor meta-regression were able to identify specific sources of the heterogeneity that may be related to the different characteristics of shift work among studies. **Conclusion:** The monitoring of serum vitamin D levels and prompt correction of any deficiencies should be considered in shift workers. Notably, since a large part of the observations are derived from Koreans, larger epidemiological studies are needed in other populations.

Martelli et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 15.

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Keywords: Circadian rhythm; job; night work; shift work; vitamin D; workers.

Evidence Level: 1A

Link: <https://www.mdpi.com/1660-4601/19/15/8919>

Management and Leadership

This month we explore the effect of training occupational health professionals to identify the cognitions and perceptions of workers with a chronic disease and the role of workplace leaders in building resilience and psychologically healthy workplaces during the pandemic.

Effects of a training program for occupational health professionals on the cognitions and perceptions of workers: A randomized controlled trial

Background: To evaluate the effects of a training program for occupational health professionals (OHPs) on their ability to identify the cognitions and perceptions of workers with a chronic disease that may hinder work participation, and on their ability to recommend evidence-based interventions aimed at the identified cognitions and perceptions. **Methods:** A randomized controlled trial was conducted in which OHPs were randomly assigned to a training program on the cognitions and perceptions of workers with a chronic disease ($n = 29$) or to a control group that did not receive training ($n = 30$). Participants received home assignments in which they had to identify the cognitions and perceptions of workers in video vignettes and had to indicate which interventions they would recommend to foster work participation. A generalized linear model repeated measures ANOVA was conducted to study the effects of the training program.

Results: The results of the analyses showed an increase in the ability to identify the cognitions and perceptions of workers of OHPs who received the training compared to the control group ($p < 0.001$). The results also showed an increased ability to recommend evidence-based interventions aimed at these cognitions and perceptions ($p < 0.001$) as a result of participation in the training. **Conclusion:** The training program helps OHPs to identify cognitions and perceptions and to recommend evidence-based interventions. This can support them in their activities to increase the work participation of workers with a chronic disease.

de Wit et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 5.

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Keywords: Cognition; insurance physicians; occupational health; occupational physicians; perception; training program.

Evidence Level: 2A

Link: <https://link.springer.com/article/10.1007/s00420-021-01823-7>

Leaders supporting leaders: Leaders' role in building resilience and psychologically healthy workplaces during the pandemic and beyond

Background: The COVID-19 pandemic is now endemic and has taken a terrible toll on the health workforce and its leaders. Stress and burnout are rampant, and health workers are leaving in record numbers. Using data collected during the first four waves of the pandemic, and a longitudinal analysis of these data, the authors identify ongoing challenges to health leadership related to building resilience and psychologically healthy workplaces. **Methods:** The article is organized around three questions: What happened during Waves 1 to 4? What did we learn? And what should be done differently? **Results:** Eight actions emerged around the theme of "leaders supporting leaders": build personal resilience; practice compassionate leadership; model effective interpersonal leadership behaviour; ensure frequent and authentic communication; participate in networks and communities of practice; balance short- and long-term commitments; apply systems thinking; and contribute to a collaborative, national strategy.

Grimes et al. 2022.

Healthcare Management Forum, vol. 35, no. 4.

User License: *PMC Open Access Subset*

Keywords: Leadership; resilience; healthy workplaces; pandemic.

Evidence Level: 6B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9127620/>

Work Ability

This month we explore the relationship between disability and demographics and measures of sickness absence and the effect of area-level environmental factors on employment for people with disability.

Predicting disability retirement among Abu Dhabi police using multiple measure of sickness absence

Background: Disability retirement has been investigated in the last two decades using predictors such as measures of sickness absence, psychological, social, and organizational work factors. The impact of various health-related and sickness measures on disability retirement across various occupational group reveal a significant relation. However, current literature lacks understanding in police personnel. **Methods:** This study examines the roles of demographic and measures of sickness absence on disability retirement among police personnel in Abu Dhabi, UAE. The case-control design was used to predict disability retirement wherein controls were matched with cases according to age and gender from those who worked in the same administration as the case at baseline, to reduce the possible confounding influence of these variables. Conditional logistic regression models were used to determine the odds-ratio of various measures of sickness absence in predicting disability retirement. **Results:** Results indicate that increased number of spells, and number of days of sickness absence can predict disability retirements among police personnel in the UAE. Results indicate that odds ratios for disability retirement for the total exposure period increased from 1.76 (95% CI = 1.42-2.20) for spells of 4-7d to 2.47 (95%CI = 1.79-3.40) for spells of > 4 weeks. When compared with their married counterparts, non-married police employees had a statistically significant increase in odds of disability retirement of almost three fold (OR = 2.93, 95% CI = 1.55-5.56). Non-field and field police officers, on the other hand, had significantly reduced odds of disability retirement compared with admin/supportive staff (OR = 0.43 and 0.28 with 95% CI = 0.19-0.96 and 0.13-0.61 respectively). Odds ratios of disability retirement at end of the exposure period for the matching variables with those obtained after additionally adjusting for all demographic variables (model b), namely, marital status, occupation, employment grade and type, and educational level. The odds ratios of disability retirement remained significantly raised for the total number of days of sickness absence and for the number of spells of sickness absence for all spell types. **Conclusions:** Recommendation to reduce the number of future disability retirements among Abu Dhabi Police include structured problem-solving process addressed through stepwise meetings between the line-managers and the employee.

Alkaabi 2022.

BMC Public Health, vol. 22, no. 1.

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Keywords: Abu Dhabi; case-control design; disability retirement; police; sickness absence.

Evidence Level: 5B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13713-9>

Do area-level environmental factors influence employment for people with disability? A scoping review

Background: Employment is an important social determinant of health and wellbeing. People with disability experience labour market disadvantage and have low labour force participation rates, high unemployment rates, and poor work conditions. Environmental factors are crucial as facilitators of or barriers to participation for people with disability. Understanding how the physical, social, and economic characteristics of local areas influence employment for people with disability can potentially inform interventions to reduce employment inequalities. **Methods:** We conducted a scoping review of research investigating associations between area-level environmental factors and employment for people with disability. **Results:** Eighteen articles published between 2000 and 2020 met the inclusion criteria, and data were extracted to map the current evidence. Area-level factors were categorised into six domains relating to different aspects of environmental context: socioeconomic environment, services, physical environment, social environment, governance, and urbanicity. The urbanicity and socioeconomic environment domains were the most frequently represented (15 and 8 studies, respectively). The studies were heterogeneous in terms of methods and data sources, scale and type of geographic units used for analysis, disability study population, and examined employment outcomes. **Conclusion:** We conclude that the current evidence base is insufficient to inform the design of interventions. Priorities for future research are identified, which include further theorising the mechanisms by which area-level factors may influence employment outcomes, quantifying the contribution of specific factors, and interrogating specific factors underlying the association between urbanicity and employment outcomes for people with disability.

Fortune et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 15.

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Keywords: Area-level; disability; employment; environmental factors; geographic; inequalities; labour force.

Evidence Level: 6A

Link: <https://www.mdpi.com/1660-4601/19/15/9082>

Adapting to the Future of Work

Aging Workforce

The implication of physically demanding and hazardous work on retirement timing

Background: The need to retain individuals longer in the workforce is acknowledged in many high-income countries. **Methods:** The present study therefore aimed to examine the importance of physically demanding work tasks (PDWT) and physically hazardous work environment (PHWE) in relation to retirement timing among pensionable workers (≥ 61 years). A particular question was whether PDWT and PHWE increased in importance with age. **Results:** Six waves (2008-2018) of the Swedish Longitudinal Occupational Survey of Health (SLOSH) were used ($n = 5201$; 56% women and 44% men; mean age at first survey was 61.0 (SD 2.0) years). Discrete time-event history analysis, stratified by socioeconomic position and gender, showed that among blue-collar workers, PDWT and PHWE were associated with an increased likelihood of retiring within the next two years. With increasing age, high-level PHWE was associated with higher probability of retiring among blue-collar men, whereas heavy PDWT was associated with lower probability of retiring among blue-collar women. Among white-collar workers, having at least some PDWT compared to no PDWT was associated with a lower likelihood of retiring within the next two years. With increasing age, exposure to PHWE was associated with higher probability of retiring among white-collar women. **Conclusion:** These results suggest that to delay retirements, organizations could offer their older employees, especially blue-collar workers and the oldest white-collar women, alternatives to PDWT and PHWE.

Stengård et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 13.

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Keywords: Actual retirement; age interactions; physical job demands; physically demanding work tasks; physically hazardous work environment; retirement timing.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/13/8123>

Technology

This month we explore the effect of a digital care program for musculoskeletal conditions on depression and work productivity and a technology-assisted telephone intervention for work-related stress management.

Impacts of digital care programs for musculoskeletal conditions on depression and work productivity: Longitudinal cohort study

Background: Comorbidity between musculoskeletal (MSK) pain and depression is highly common, and is associated with a greater symptom burden and greater loss of work productivity than either condition alone. Multimodal care programs tackling both physical and mental health components may maximize productivity recovery and return to work. Digital delivery of such programs can facilitate access, ensure continuity of care, and enhance patient engagement. **Objective:** The aim of this study was to assess the impact of a completely remote multimodal digital care program (DCP) for MSK pain on mental health and work-related outcomes stratified by baseline depression levels. **Methods:** Ad hoc analysis of an interventional, single-arm, cohort study of individuals with MSK pain undergoing a DCP was performed. Three subgroups with different baseline depression severity levels were established based on responses to the Patient Health Questionnaire (PHQ-9): cluster 1 (score<5: minimal depression), cluster 2 (scores 5-10: mild depression), and cluster 3 (score≥10: moderate depression). The mean changes in depression, anxiety, fear-avoidance beliefs, work productivity, and activity impairment and adherence between baseline and end of program (8-12 weeks) were assessed across subgroups by latent growth curve analysis. **Results:** From a total of 7785 eligible participants, 6137 (78.83%) were included in cluster 1, 1158 (14.87%) in cluster 2, and 490 (6.29%) in cluster 3. Significant improvements in depression and anxiety scores were observed in clusters 2 and 3 but not in cluster 1, with average end-of-the program scores in clusters 2 and 3 below the initially defined cluster thresholds (score of 5 and 10, respectively). All clusters reported significant improvements in productivity impairment scores (mean changes from -16.82, 95% CI -20.32 to -13.42 in cluster 1 to -20.10, 95% CI -32.64 to -7.57 in cluster 3). Higher adherence was associated with higher improvements in depression in clusters 2 and 3, and with greater recovery in activities of daily living in cluster 3. Overall patient satisfaction was 8.59/10.0 (SD 1.74). **Conclusions:** A multimodal DCP was able to promote improvements in productivity impairment scores comparable to those previously reported in the literature, even in participants with comorbid depression and anxiety. These results reinforce the need to follow a biopsychosocial framework to optimize outcomes in patients with MSK pain.

Costa et al. 2022.

Journal of Medicine Internet Research, vol. 24, no. 7.

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Keywords: Activities of daily living; anxiety; comorbidity; depression; digital care; digital health; engagement; job; longitudinal cohort; mental health; multimodal; musculoskeletal; occupational health.

Evidence Level: 4B

Link: <https://www.jmir.org/2022/7/e38942/>

A technology-assisted telephone intervention for work-related stress management: Pilot randomized controlled trial

Background: Stress management interventions combining technology with human involvement have the potential to improve the cost-effectiveness of solely human-delivered interventions, but few randomized controlled trials exist for assessing the cost-effectiveness of technology-assisted human interventions.

Objective: The aim of this study was to investigate whether a technology-assisted telephone intervention for stress management is feasible for increasing mental well-being or decreasing the time use of coaches (as an approximation of intervention cost) while maintaining participants' adherence and satisfaction compared with traditional telephone coaching. **Methods:** A 2-arm, pilot randomized controlled trial of 9 months for stress management (4-month intensive and 5-month maintenance phases) was conducted.

Participants were recruited on the web through a regional occupational health care provider and randomized equally to a research (technology-assisted telephone intervention) and a control (traditional telephone intervention) group. The coaching methodology was based on habit formation, motivational interviewing, and the transtheoretical model. For the research group, technology supported both coaches and participants in identifying behavior change targets, setting the initial coaching plan, monitoring progress, and communication. The pilot outcome was intervention feasibility, measured primarily by self-assessed mental well-being (WorkOptimum index) and self-reported time use of coaches and secondarily by participants' adherence and satisfaction. **Results:** A total of 49 eligible participants were randomized to the research (n=24) and control (n=25) groups. Most participants were middle-aged (mean 46.26, SD 9.74 years) and female (47/49, 96%). Mental well-being improved significantly in both groups (WorkOptimum from "at risk" to "good" $\hat{A}>0.85$; $P<.001$), and no between-group differences were observed in the end ($\hat{A}=0.56$, 95% CI 0.37-0.74; $P=.56$). The total time use of coaches did not differ significantly between the groups (366.0 vs 343.0 minutes, $\hat{A}=0.60$, 95% CI 0.33-0.85; $P=.48$). Regarding adherence, the dropout rate was 13% (3/24) and 24% (6/25), and the mean adherence rate to coaching calls was 92% and 86% for the research and control groups, respectively; the frequency of performing coaching tasks was similar for both groups after both phases; and the diligence in performing the tasks during the intensive phase was better for the research group (5.0 vs 4.0, $\hat{A}=0.58$, 95% CI 0.51-0.65; $P=.03$), but no difference was observed during the maintenance phase. Satisfaction was higher in the research group during the intensive phase (5.0 vs 4.0, $\hat{A}=0.66$, 95% CI 0.58-0.73; $P<.001$) but not during the maintenance phase. **Conclusions:** The technology-assisted telephone intervention is feasible with some modifications, as it had similar preliminary effectiveness as the traditional telephone intervention, and the participants had better satisfaction with and similar or better adherence to the intervention, but it did not reduce the time use of coaches. The technology should be improved to provide more digested information for action planning and templates for messaging.

Muuraikangas et al. 2022.

Journal of Medicine and Internet Research, vol. 24, no. 7.

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Keywords: Feasibility; health behavior change intervention; mental well-being; occupational health; randomized controlled trial; remote coaching; stress management; technology-assisted coaching; telephone coaching.

Evidence Level: 2A

Link: <https://www.jmir.org/2022/7/e26569/>

Guiding and Supporting Mental Health and Wellbeing

Mental Health

This month we explore the relationship between mental health and work-related and socioeconomic factors, including participation in leisure and social activities, employment industry and occupational class, and precarious employment. Studies also explore the role of unemployment, financial hardship, and economic recession on suicidal behaviours, changes in depression domains as a predictor of return to work, why workers suffer burnout and workplace limitations related to mental health in health care workers.

Symptom patterns in patients newly sick listed for common mental disorders and associations with work-related and socioeconomic factors: A cross-sectional study in Swedish primary care

Background: The aim was to determine symptom patterns of depression, anxiety and stress-related mental disorders in newly sick listed due to common mental disorders in Swedish primary care patients and to examine associations with sick leave diagnosis, also in relation to socioeconomic, work-related and demographic factors. **Design:** Cross-sectional study. **Setting:** Primary care in western Sweden.

Participants: From a randomised controlled trial, patients aged 18-67, seeking primary care and on sick leave due to depression, anxiety and/or mental stress, in total 341 individuals, during 2018-2020.

Primary outcome measures: Patterns of depressive, anxiety and stress symptoms measured via self-assessment questionnaires (Montgomery Asberg Depression Rating Scale-Self (MADRS-S), General Anxiety Disorder Scale-7 (GAD-7), Karolinska Exhaustion Disorder Scale (KEDS)), sick leave diagnosis, perception of Work Ability Index and job strain via the job strain model. **Results:** A combination of high levels of depressive and stress-related symptoms was more frequent than single symptom clusters among persons with common mental disorders (CMD) on sick leave: 7% of the patients had scores above cut-off for one of the instruments MADRS-S, GAD-7 and KEDS, 12% above cut-off for two and 80% had above cut-off for all three instruments. There was no significant association between low socioeconomic status, high-job strain or working in healthcare/education and having scores above cut-off level for two or more of the instruments. Only perception of own poor work ability showed association with having scores above cut-off level for all three of the assessment instruments of CMD (OR 9.45, 95% CI 2.41 to 37.04). **Conclusion:** The diagnosis on the sick certificate is not always congruent with the dominating symptom score level. In patients sick-leaved for CMDs, possible negative factors such as low socioeconomic status, low social support, high-work strain or working in healthcare/education sector did not show significant associations with self-assessment instruments of anxiety, depression and stress. Only patient's perception of own poor work ability was associated with high scores on all three domains.

Svenningsson et al. 2022.

BMJ Open, vol. 12, no. 7.

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Keywords: Anxiety disorders; depression & mood disorders; mental health; primary care.

Evidence Level: 4B

Link: <https://bmjopen.bmj.com/content/12/7/e054250.long>

Participating in different activities and their association with mental health problems in the working disabled population in Korea

Background: There are a large number of people suffering from disabilities and this number is rapidly rising. People with disabilities experience various hardships and are more vulnerable to mental health problems. Participating in different types of activities (e.g., leisure, social, etc.) has been shown to ameliorate people's mental health problems such as stress and depression. The aim of this study was to assess the effects of leisure and social activities on the mental well-being of the working disabled population in Korea. **Methods:** A total of 1521 disabled people aged between 15 and 64 were included in the study. The degree of participation in leisure (i.e., weekends or weekdays) and social activities, as well as stress and depressive symptoms, were measured using single-item questions. The association between participation in different activities (i.e., leisure and social) and mental health (i.e., stress and depression) was analyzed using a generalized estimating equation (GEE) model. **Results:** In the fully adjusted model, participation in leisure activities was associated with the level of stress, and less leisure participation was significantly associated with higher odds of stress. For example, in the "2 or fewer hours" group (odds ratio [OR] = 1.461, 95% confidence interval [CI] = 1.193-1.789) with the "5 h or more" group used as the reference for weekdays and the "5-9 h" group (OR = 1.223, 95% CI = 1.007-1.486) with the "10 h or more" group used as the reference for weekends. In terms of participation in social activities, increased participation was associated with lower levels of depression. For example, in the "Very much" group (OR = 0.314, 95% CI = 0.156-0.633) compared to the "Not at all" group. **Conclusions:** Participation in different activities was associated with better mental health outcomes in the working disabled population in Korea.

Chon et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: Depression; disabled; leisure activity; social activity; stress.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/14/8348>

Changes in depression domains as predictors of return to work in common mental disorders

Background: Depression highly impairs function and reduces quality of life. Therefore, both symptomatic and functional recovery are important treatment goals. Depression consists of several cognitive, somatic, and affective symptom factors that differently affect function. However, it is unclear whether changes in these domains predict return to work (RTW) after treatment. **Methods:** Data were collected during treatment from patients on full or partial sick leave reporting depression symptoms (N = 300) at an out-patient clinic. Information on work status was assessed pre- and post-treatment and at 6 months follow-up. Multiple logistic regression was used to investigate if residualized changes in symptom factors predicted full RTW, controlling for gender, education level, and age. **Results:** Changes (as symptom improvement) in the cognitive, somatic, and affective factor scores each significantly predicted full RTW post-treatment and at follow-up for patients on full and partial sick leave, even after controlling for gender, education level, and age. The change in the somatic factor explained the largest proportion of variance for full work post-treatment in patients on full sick-leave, while change in the cognitive factor explained most unique variance for patients on graded sick leave. **Limitations:** The sample consisted of a majority of women with a relatively high level of education. This study should be replicated in more heterogeneous samples. **Conclusion:** Changes in depression symptom domains are significant predictors for RTW work post-treatment. The change in the somatic factor explained the largest proportion of variance in patients on full sick leave and thus may particularly influence RTW after treatment.

Gjengedal et al. 2022.

Journal of Affective Disorders, vol. 308.

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Keywords: Depression symptom domains; predictors for return to work; sick leave; treatment.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0165032722004219?via%3Dihub>

Employment industry and occupational class in relation to serious psychological distress in the United States

Background: Occupational characteristics may influence serious psychological distress (SPD) and contribute to health inequities; yet, few studies have examined multiple employment industries and occupational classes in a large, racially diverse sample of the United States. **Methods:** Using data from the National Health Interview Survey, we investigated employment industry and occupational class in relation to SPD in the overall population and by race/ethnicity, gender, age, household income, and health status. We created eight employment industry categories: professional/administrative/management, agricultural/manufacturing/construction, retail trade, finance/information/real estate, educational services, health care/social assistance, accommodation/food services, and public administration/arts/other services. We also created three occupational class categories: professional/management, support services, and laborers. SPD was measured using the Kessler Psychological Distress Scale and scores ≥ 13 indicated SPD. We adjusted for confounders and used Poisson regression to estimate prevalence ratios (PRs) and 95% confidence intervals (CIs). **Results:** Among the 245,038 participants, the mean age was 41.7 ± 0.1 years, 73% were Non-Hispanic (NH)-White, and 1.5% were categorized as having SPD. Compared to the professional/ administrative/ management industry, working in other industries (e.g., manufacturing/construction (PR = 0.82 [95% CI: 0.70-0.95]) and educational services (PR = 0.79 [95% CI: 0.66-0.94])) was associated with lower SPD. Working in support services and laborer versus professional/management positions were both associated with 19% higher prevalence of SPD (95% CI: 1.04-1.35; 95% CI: 1.04-1.38, respectively). Furthermore, working in a support services or laborer versus professional/management position was associated with higher SPD in most employment industries. **Conclusion:** Industry-specific workplace interventions to equitably improve mental health are warranted.

Gullett et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: Economic status; employment; mental health; occupational health; occupations; psychological distress; race factors.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/14/8376>

The role of unemployment, financial hardship, and economic recession on suicidal behaviours and interventions to mitigate their impact: A review

Background: Understanding the social determinants and risk factors for suicidal behaviors underlies the development of effective suicide prevention interventions. **Methods:** This review focused on recently published literature (2010 onwards), with the aim to determine the role of economic factors (at the individual and population level) on suicidal behaviors and ideation as well as the effectiveness of interventions addressing these factors in reducing suicidal behaviors and ideation. Where available, literature examining the economic impact of COVID-19 was highlighted. **Results:** Economic recession and unemployment are associated with increased risk of suicidal behavior at the population and individual level. Additionally, personal financial problems such as debt and financial strain are associated with increased risk of suicidal behavior and ideation at the individual level. Regarding interventions, unemployment benefits, employment protection legislation, higher minimum wage and active labor market programs may reduce suicide at the population level. However, it is not clear what impact they have at the individual level, nor in relation to suicide attempts, self-harm, or suicidal ideation. There was a lack of evidence as to the effectiveness of financially focused suicide prevention interventions at either level. Current findings were contextualized within, and advance, prominent social theoretical models.

Conclusions: Recommendations focused on future areas of research, including the unfolding economic impact of COVID-19, as well as the co-design and evaluation of tailored interventions and/or gatekeeper training for those in the financial and welfare sector, and enhanced early education aimed at increasing financial literacy in young people before onset or exacerbation of financial hardship.

Mathieu et al. 2022.

Frontiers in Public Health, vol. 10.

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Keywords: COVID-19; economic recession; financial hardship; self-harm; suicide; unemployment; welfare benefits.

Evidence Level: 6A

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2022.907052/full>

Why employees experience burnout: An explanation of illegitimate tasks

Background: Among the many workplace stressors, a new type of stressor has been identified: illegitimate tasks. This newly identified type of stressor refers to work tasks that do not meet employee role expectations and constitute a violation of professional identity. **Methods:** To investigate illegitimate tasks' mediating mechanisms and boundary conditions on job burnout, we examined a cross-level first-stage moderated mediation model with the collective climate as a moderator and psychological entitlement as a mediator. **Results:** Grounded in the job demands-resources model (JD-R) and justice theory, the current study uniquely posits that illegitimate tasks can lead to burnout by way of psychological entitlement; however, this effect is less where collective climate is higher. Data were collected from 459 employees on 89 teams at enterprises in China. The results of the analysis, using HLM, MPLUS and SPSS revealed that illegitimate tasks stimulated employees' psychological entitlement and led to job burnout. While employees' psychological entitlement played a partially mediating role between illegitimate tasks and job burnout, a collective climate could weaken the stimulating effect of illegitimate tasks on employees' psychological entitlement and then negatively affect the mediating effect of psychological entitlement between illegitimate tasks and burnout. **Conclusion:** The study reveals the antecedents of burnout from the perspective of job tasks and psychological entitlement, offers practical insight into the mechanism of illegitimate tasks on employee job burnout and recommends that organizations develop a collective

climate to reduce employees' psychological entitlement and job burnout for steady development of the enterprise.

Ouyang et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 15.

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Keywords: Collective climate; illegitimate tasks; job burnout; psychological entitlement.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/15/8923>

Precarious employment and migrant workers' mental health: A systematic review of quantitative and qualitative studies

Background: Evidence suggests that precarious employment can have detrimental effects on workers' health, including mental health. Migrant workers are discussed to be especially vulnerable to such effects. Thus, we systematically reviewed existing research on the association between precarious employment and migrant workers' mental health. **Methods:** Three electronic databases (Web of Science, PsycINFO and PubMed/Medline) were searched for original articles on quantitative and qualitative studies published from January 1970 to February 2022 in English, German, Turkish and Spanish. Multiple dimensions of precarious employment were considered as exposure, with mental health problems as outcomes. Narrative synthesis and thematic analyses were performed to summarize the findings of the included studies along with risk of bias and quality assessment. **Results:** The literature search resulted in 1557 original articles, 66 of which met the inclusion criteria - 43 were of high quality and 22 were of moderate quality. The most common exposure dimensions analyzed in the studies included temporariness, vulnerability, poor interpersonal relationships, disempowerment, lacking workers' rights and low income. The outcome measures included stress, depression, anxiety and poor general mental health. The prevalence of these outcomes varied between 10-75% among the included quantitative studies. All qualitative studies reported one or more dimensions of precarious employment as an underlying factor of the development of mental health problems among migrants. Of 33 quantitative studies, 23 reported evidence for an association between dimensions of precarious employment and mental health. **Conclusion:** The results of this review support the hypothesis that precarious employment is associated with migrant workers' mental health.

Koseoglu Ornek et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 48, no. 5.

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Keywords: Mental health; migrant workers; precarious employment; stress.

Evidence Level: 1A

Link: <https://www.sjweh.fi/article/4019>

Mental illness and work-related limitations in healthcare workers: A preliminary retrospective study

Background and Methods: This retrospective observational study investigated hospital staff requests for job fitness visits, addressed to occupational medicine. Specific objectives were to analyze: (1) health workers' requests, sociodemographic characteristics, psychiatric diagnoses, assigned doctor's fit notes, and (orthopedic, psychiatric) limitations; (2) associations between psychiatric diagnoses, sociodemographic (sex, age), and work-related (job, department) characteristics; (3) associations between the same psychiatric diagnoses/orthopedic limitations, fit notes, and/or psychiatric limitations. **Results:** Data of St. Orsola-Malpighi Polyclinic health workers (N = 149; F = 73.8%; mean age = 48 ± 9.6 years), visited by both the occupational medicine physician and psychiatrist (January 2016-May 2019), were analyzed. 83.2% of the sample presented with at least one psychiatric diagnosis, including mood (47%), anxiety (13.4%), and anxious-depressive (10.7%) disorders. Significant differences between psychiatric diagnoses according to sex and fit notes (both p < 0.01) have been found, whereas no significant associations based on age and work-related characteristics have been observed. Analysis of frequencies of participants with the same psychiatric diagnosis (orthopedic limitation being equal), according to doctor's fit notes and psychiatric work limitations, showed a high heterogeneity of assignments. The current occupational medicine procedure for fit notes/job limitations assignments does not allow taking into consideration clinical factors possibly associated with more specific assignments. **Conclusion:** To standardize the procedure and

translate the psychiatrist's clinical judgment into practice, further studies to test the usefulness of clinimetrics, which might represent a reliable approach in considering different fit notes and job limitations, are needed.

Gostoli et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 15.

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Keywords: Clinimetrics; fit note; job limitation; occupational medicine; psychiatric diagnosis.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/15/9098>

Bullying and Harassment

How job demands and resources relate to experiences of bullying and negative acts among university employees

Background: This article addresses a gap in the work psychology literature regarding psychosocial working conditions and bullying among staff in academic organizations. **Methods:** We examine the influences, institutional demands, and resources attached to given academic positions, such as how the level of social support and cooperation influence the level of experienced negative acts at work and bullying in different work groups in an academic work environment. We also examine whether some professions or positions in an academic organization are more vulnerable due to organizational structure, perceived and experienced resources, and demands to bullying or experiencing more negative acts at work. A common division of different employees in the university sector is between administrative/technical staff and scientific personnel. Our hypothesis in this study is that there are significant differences among these two groups regarding levels of experienced social support and cooperation, as well as levels of experienced negative acts at work. **Results:** We postulate that differences in job demands and resources lead to significantly different levels of self-reported bullying for the two main groups of personnel. We expect scientific personnel to be more exposed to negative acts at work and bullying due to differences in the demands and resources associated with these positions.

Bjaalid et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: JD-R model; higher education; negative acts questionnaire; workplace bullying.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/14/8460>

Psychosocial Issues

This month we explore the relationship between psychosocial work factors and self-reported health, and between precarious employment and chronic stress. In Covid-19 specific research studies explore the psychological impact of the pandemic on primary care workers, the resilience of health care and the impact of work-related stress on the cognition domain of executive functioning during the pandemic.

Prospective associations between psychosocial work factors and self-reported health: study of effect modification by gender, age, and occupation using the national French working conditions survey data

Background: Prospective studies exploring the effects of psychosocial work factors on self-reported health (SRH) are lacking, especially those studying effect modifications. The objectives were to examine the prospective associations of these factors, and multiple exposures to these factors, with SRH in a national representative sample, and effect modifications by gender, age, and occupation. **Methods:** The prospective study relied on the three data collection waves (2013, 2016, and 2019) of the national French Working Conditions survey and was based on a sample of 15,971 employees, in good SRH at the beginning of the follow-up period. The occupational exposures were time-varying variables measured in 2013 and 2016, and

included: 20 psychosocial work factors grouped into 5 broad domains, 4 exposures related to working time/hours and 4 physical-biomechanical-chemical exposures. The incidence of poor SRH three years later was the outcome. Discrete time Poisson regression models were performed using weighted data and with adjustment for gender, age, marital status, life events, and occupation. **Results:** Almost all the studied psychosocial work factors were predictive of poor SRH. Some physical-biomechanical-chemical exposures were found to predict poor SRH. Only rare effect modifications were observed according to gender, age, and occupation. Dose-response associations between multiple exposures and the incidence of poor SRH were observed for 4 among 5 domains of psychosocial work factors. **Conclusions:** Our study underlined the effects of psychosocial work factors, as well as multiple exposure effects, on the incidence of poor SRH. However, most of these effects were the same across population groups related to gender, age, and occupation.

Neidhammer et al. 2022.

BMC Public Health, vol. 22, no. 1.

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Keywords: Age; gender; occupation effect modification; occupational exposures; psychosocial work factors; self-reported health.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13773-x>

Psychological impact of the COVID-19 pandemic on primary care workers: A cross-sectional study

Background: The COVID-19 pandemic has had a major impact on the mental health of healthcare workers, yet studies in primary care workers are scarce. **Aim:** To investigate the prevalence of and associated factors for psychological distress in primary care workers during the first COVID-19 outbreak. **Design and setting:** This was a multicentre, cross-sectional, web-based survey conducted in primary healthcare workers in Spain, between May and September 2020. **Method:** Healthcare workers were invited to complete a survey to evaluate sociodemographic and work-related characteristics, COVID-19 infection status, exposure to patients with COVID-19, and resilience (using the Connor-Davidson Resilience Scale), in addition to being screened for common mental disorders (depression, anxiety disorders, post-traumatic stress disorder, panic attacks, and substance use disorder). Positive screening for any of these disorders was analysed globally using the term 'any current mental disorder'. **Results:** A total of 2928 primary care professionals participated in the survey. Of them, 43.7% (95% confidence interval [CI] = 41.9 to 45.4) tested positive for a current mental disorder. Female sex (odds ratio [OR] 1.61, 95% CI = 1.25 to 2.06), having previous mental disorders (OR 2.58, 95% CI = 2.15 to 3.10), greater occupational exposure to patients with COVID-19 (OR 2.63, 95% CI = 1.98 to 3.51), having children or dependents (OR 1.35, 95% CI = 1.04 to 1.76 and OR 1.59, 95% CI = 1.20 to 2.11, respectively), or having an administrative job (OR 2.24, 95% CI = 1.66 to 3.03) were associated with a higher risk of any current mental disorder. Personal resilience was shown to be a protective factor. **Conclusion:** Almost half of primary care workers showed significant psychological distress. Strategies to support the mental health of primary care workers are necessary, including designing psychological support and resilience-building interventions based on risk factors identified.

Aragonès et al. 2022.

The British Journal of General Practice, vol. 72, no. 720.

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Keywords: COVID-19 pandemic; cross-sectional study; health personnel; mental health; primary health care; psychological resilience.

Evidence Level: 4B

Link: <https://bjgp.org/content/72/720/e501.long>

Resilience among health care workers while working during a pandemic: A systematic review and meta synthesis of qualitative studies

Background and Methods: This systematic review explored the evidence related to health care workers resilience during the covid-19 pandemic. From the 121 studies 6 main themes related to health care workers resilience emerged including moral purpose and duty, connections, collaboration, organizational culture, character and potential for growth. **Conclusion:** The authors concluded that health care workers

resilience was related to their professional identity, collegial support, effective communication from supportive leaders along with flexibility to engage in self-care and experiences of growth.

Curtin et al. 2022.

Clinical Psychology Review, vol 95.

Keywords: COVID-19; health care workers; mental health; pandemic; resilience.

Evidence Level: 1A

Link: <https://www.sciencedirect.com/science/article/pii/S0272735822000587?via%3Dihub>

The impact of work-related stress on the cognition domain of executive functioning of health care workers during the COVID-19 pandemic

Purpose: The current study addressed work-related stress and burnout experienced by health care workers (HCWs) in Cairo University isolation hospital and its impact on the cognitive domain of their executive functioning. **Methods:** Arabic validated questionnaires of Beverly Potter for sources of work-related burnout and Maslach Burnout Inventory Human Services Survey for evaluation of burnout degree of 81 HCWs were used. Wisconsin Card Sorting Test was used to examine the HCWs cognitive executive functioning during hospital work and 2 weeks after home isolation. **Results:** A high degree of work-related stress was evident by a high score on Beverly questionnaire with a mean \pm SD of (132.08 \pm 12.573). A high degree of burnout was marked with a mean \pm SD of (28.48 \pm 6.622) for Emotional Exhaustion module, (31.85 \pm 5.439) Personal Achievement, and (17.52 \pm 6.707) Depersonalization. Health care workers experienced impairment of executive functioning in the form of increased total errors of Wisconsin Card Sorting Test during hospital shifts compared to 2 weeks after. There is a positive significant correlation between work-related stress level and Maslach Burnout Inventory and the total errors of Wisconsin Card Sorting Test results during the hospital stay ($p = < 0.001$), as well as 2 weeks after ($p = < 0.001$). This cognitive decline manifested in increased errors during HCWs' clinical work. **Conclusions:** Health care workers on the front line experienced a high degree of work-related stress in addition to burnout in the form of Emotional Exhaustion, Depersonalization, and reduced Personal Achievement. They also suffered from impaired cognitive executive functioning due to such stressful exposure.

Farahat et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 5.

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Keywords: Burnout; COVID-19; cognitive domain; executive functioning; health care workers; isolation hospital; work-related stress.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007/s00420-021-01814-8>

Association between precarious employment and chronic stress: Effect of gender, stress measurement and precariousness dimensions - A cross-sectional study

Background: Precarious employment has been highlighted as a social determinant of health, given, among others, to its alleged association with chronic stress. However, few studies have been conducted analyzing such association, using both perceived stress indicators and biological markers. **Methods:** Accordingly, the present study analyzed the association of multidimensional (6 dimensions) precarious employment scale with perceived stress and 23 markers of adrenal and gonadal hormone production, including cortisol.

Results: The sample consisted of 255 salaried workers from Barcelona (125 men, 130 women) aged 25-60. OLS regression models stratified by sex were conducted. Results demonstrated that precarious employment increased the probabilities of having perceived stress in both sexes. In addition, the production of adrenal hormones among men is associated with precarious wages and among women with precarious contracts ("Temporariness", "Disempowerment", and "Rights" dimensions). **Conclusion:** Therefore, precarious employment could be embodied by workers, altering their perceived well-being and physiological characteristics. Differences between men and women in the physiological effect of precarious employment could express not just the biochemical differences inherent to biological sex, but also the social construction of gender identities, positions and roles in society and family, as well as gender inequalities in the labour market.

Julià et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 15.

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Keywords: Chronic stress; cortisol; gender; precarious employment; social determinants of health.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/15/9099>

Enabling Healthy and Safe Workplaces

Health and Wellbeing

This month we explore a range of health and wellbeing topics. In the area of sleep wellbeing the interplay between sleep quality and work-related health and work productivity and the effectiveness of personalized therapies for insomnia among workers using a sleep prompt app are presented. In Covid-19 related research the association between working hours flexibility and well-being prior to and during covid and infection rates associated with the workplace are explored. Other areas explored include the occupational difference in oral health status and behaviors, the association of smartphone-recorded steps over years and change in cardiovascular risk factors, the impact of health education and media campaign on tobacco control measures role and the suitability of opt-in HIV testing in construction workplaces.

Quality of sleep and work productivity among white-collar workers during the COVID-19 pandemic

Background and Objectives: The COVID-19 pandemic has disrupted routine sleep and work patterns in the general population. We conducted an anonymous online survey among white-collar workers from various finance, IT and technology companies in Lithuania to define factors associated with worse sleep quality and diminished productivity during a COVID-19 lockdown. **Materials and Methods:** Employees of selected companies in Lithuania completed an anonymous questionnaire online that included the Pittsburgh Sleep Quality Index (PSQI), The Sleep Locus of Control (SLOC), the Generalized Anxiety Disorder Scale-7 (GAD-7), and the World Health Organization's Health and Work Performance Questionnaire (WHO-HPQ).

Respondents also provided information about their sleep hygiene, physical activity and alcohol use.

Results: Data of 114 respondents (56, 49.1% male) were used for analysis. Among them, 49 (43.0%) suffered from poor sleep and 29 (25.4%) had clinically relevant levels of anxiety. However, there were only negligible levels of absenteeism in the sample (a median of zero hours of work lost over the past month). In a stepwise linear regression model ($F(5,108) = 11.457$, $p < 0.001$, $R^2_{adj} = 0.316$), high levels of anxiety, daily hours spent using the screen, use of electronic devices in the bedroom, smoking in the evening, and COVID-19-related changes in appetite were associated with worse sleep quality. Absenteeism was associated with physical activity of moderate intensity and decreased self-reported productivity during the pandemic ($F(2,111) = 7.570$, $p = 0.001$, $R^2_{adj} = 0.104$). However, there was no strong relationship between sleep-related variables (i.e., sleep hygiene, sleep locus of control, quality of sleep) or levels of anxiety and measures of work productivity. **Conclusions:** Our findings suggest that while bad sleep hygiene, anxiety, and changes in appetite are associated with worse sleep quality among white-collar workers during the pandemic, work productivity may remain high irrespective of disrupted sleep.

Žilinskas et al. 2022.

Medicina, vol. 58, no. 7.

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Keywords: Absenteeism; anxiety; lockdown; presenteeism; sleep locus of control.

Evidence Level: 5B

Link: <https://www.mdpi.com/1648-9144/58/7/883>

Opt-in HIV testing in construction workplaces: An exploration of its suitability, using the socioecological framework

Background: Late diagnosis of HIV remains a challenge, despite improved testing and treatment. Testing is often targeted at high-risk groups; workplace events might normalise testing and allow access to a wider

population. The construction workforce has a number of risk factors for HIV. In the Test@Work study, HIV tests were delivered within general health checks to construction employees, with high uptake and acceptability. This paper reports on the experiences of construction managers and health professionals involved in Test@Work and explores the suitability of construction worksites as a venue for opt-in HIV testing. **Methods:** Qualitative interviews (n = 24) were conducted with construction managers who had facilitated health check/HIV testing (n = 13), and delivery partners (n = 11) including i) healthcare volunteers who had delivered general health checks (n = 7) and, ii) HIV professionals who had conducted HIV testing (n = 4) at 21 Test@Work events held on construction sites. Interviews explored their experiences of these events and views towards HIV testing in the workplace. Exit questionnaires (n = 107) were completed by delivery partners after every event, providing qualitative data identifying facilitators and barriers to effective delivery. Thematic analysis identified themes that were mapped against a socioecological framework. **Results:** Delivery partners reported high engagement of construction workers with workplace HIV testing, peer-to-peer encouragement for uptake, and value for accessibility of onsite testing. HIV professionals valued the opportunity to reach an untested population, many of whom had a poor understanding of their exposure to HIV risk. Managers valued the opportunity to offer workplace health checks to employees but some identified challenges with event planning, or provision of private facilities. **Conclusions:** The construction sector is complex with a largely male workforce. Providing worksite HIV testing and education to an untested population who have poor knowledge about HIV risk helped to normalise testing, encourage uptake and reduce HIV-related stigma. However, there are practical barriers to testing in the construction environment. Rapid testing may not be the most suitable approach given the challenges of maintaining confidentiality on construction worksites and alternatives should be explored.

Somerset et al. 2022.

BMC Public Health, vol. 22, no. 1.

User License: Creative Commons Attribution (CC BY 4.0) (<https://creativecommons.org/licenses/by/4.0/>)

Keywords: Construction; HIV; health promotion; health protection; health screening; men's health; sexual health; workplace.

Evidence Level: 5B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13787-5>

Providing brief personalized therapies for insomnia among workers using a sleep prompt app:

Randomized controlled trial

Background: Insomnia is the most common sleep disorder and the foremost health concern among workers. We developed a new sleep prompt app (SPA) for smartphones to positively alter the users' consciousness and behavior by sending timely short messages for mild sleep problems at an early stage.

Objective: The aim of this study is to investigate the effectiveness of the SPA in providing brief personalized therapy for insomnia among workers. **Methods:** We conducted a 2-arm parallel randomized controlled trial. The intervention group used the SPA, and the control group received no intervention. Participants were recruited between November 2020 and January 2021. The researcher sent emails for recruitment to more than 3000 workers of 2 companies and 1 university in Japan. The SPA provided personalized prompt messages, sleep diaries, sleep hygiene education, stimulus control therapy, and sleep restriction therapy. The prompt messages were sent automatically to the participants to encourage them to improve their sleep habits and sleep status and were optimized to the individual's daily rhythm. The intervention program duration was 4 weeks. The primary outcome was a change in the Insomnia Severity Index (ISI) for the study period. The ISI was obtained weekly using a web questionnaire. **Results:** A total of 116 Japanese workers (intervention group n=60, control group n=56) with sleep disorders were recruited. Two participants in the intervention group were excluded from the analyses because of challenges in installing the SPA. The mean ISI scores at baseline were 9.2 for both groups; however, after 4 weeks, the mean ISI scores declined to 6.8 and 8.0 for the intervention and control groups, respectively. Primary analysis using a linear mixed model showed a significant improvement in the temporal trends of the ISI in the SPA group and in the total population (P=.03). Subgroup analyses of ISI-8-insomniacs revealed a significant improvement in the temporal trends of ISI in the SPA group (P=.01), and the CFS score for physical condition significantly improved following the intervention (P=.02). **Conclusions:** This study demonstrates the effectiveness of the SPA in providing brief personalized therapy for insomnia among Japanese workers with mild insomnia. The

physical fatigue score significantly improved in ISI-8-insomniacs. Thus, SPA could play an important role in reducing the adverse effects of sleep disorders in workers. To promote the wide use of the SPA in the future, further studies are required to examine its effectiveness in other age groups and individuals with health problems.

Shimamoto et al. 2022.

Journal of Medical Internet Research, vol. 24, no. 7.

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Keywords: Japan; brief personalized therapies for insomnia; randomized controlled trial; sleep prompt app; smartphone; worker.

Evidence Level: 2B

Link: <https://www.jmir.org/2022/7/e36862/>

Tobacco control measures' role in improving employees' health under the impact of health education and media campaign

Background: The overarching purpose of this study was to investigate the impact of health education, media campaigns, and peer counselor training on employees' health. **Methods:** This study also attempted to evaluate the function of tobacco control as a mediator in the relationship between employees' health and health education, media campaigns, and peer counselor training. Data were collected from 440 tobacco industry workers in China using a questionnaire technique. Smart-PLS software and a structural equation modeling (SEM) technique were used to evaluate the data. **Results:** Employees' health was found to be significantly improved by health education, media campaigns, and peer counselor training. Furthermore, tobacco control was discovered to moderate the association between employee health and health education, media campaigns, and peer counselor training. **Conclusion:** By analyzing the impact of health education, media campaigns, and peer counselor training on employees' health, this research provided an important theoretical contribution. In terms of practical applications, this study would help employees consuming tobacco to maintain a healthy and safe atmosphere that encourages them to be engaged and perform well. Furthermore, this study could prove effective in resolving difficulties linked to controlling employee tobacco addiction and improving their performance. The tiny sample size of this study, which included solely employees working in the Chinese tobacco sector, was one of its limitations. In addition, future studies can incorporate other constructs to acquire a deeper knowledge of the factors that influence employees' health.

Wu 2022.

Frontiers in Public Health, vol. 10.

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Keywords: Employee health; health education; media campaign; peer counselor training; tobacco control.

Evidence Level: 5B

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2022.904894/full>

The interplay between poor sleep and work-related health

Background: Sleep disorders can arise from work. Employees who experience work overload are more likely to develop sleep problems. Poor sleep leads to decreased performance, sick leave, and accidents. Therefore, sleep disorders may be linked to workplace hazards as well as decreased occupational health, however, the relationship remains unknown. **Methods:** This relationship was examined using secondary data analysis of aggregated survey data from 97 companies based in Germany between 2003 and 2020 as part of Workplace Health Management project. Two extreme groups with respect to sleep problems were analyzed ($N = 4,865 + 9,795$). The survey "Diagnosis of corporate health" contained 137 individual questions which recorded all relevant working conditions, aspects of health, and one question relating to insomnia traits. A one-way analysis of variance was used to examine whether and to what extent the potentials, hazards, and health aspects differed between employees depending on their perceived sleep problems. In addition, multiple linear regressions were used to determine whether and to what extent work characteristics affect various health aspects for both good and poor sleepers.

Results: In total, 49.7% of staff reported moderate difficulty falling and/or remaining asleep. These poor sleepers perceived all health potentials worse than good sleepers, especially on scales such as fair

assessment, work climate, and learning at work. Furthermore, poor sleepers perceived health hazards (physical environmental stress, job insecurity, and time pressure) more whilst positive health indicators (joy of work and confidence) were perceived less. **Conclusion:** Overall, the determination of sleep difficulties could be used as a substantial health indicator. Also, these sleep problems are reported more frequently in certain occupations compared to others, which could mean that the perception of sleep health varies between professions. Therefore, it is important to implement specific recommendations for each industry in order to improve working conditions for poor sleepers which in turn, improves their health.

Fietze et al. 2022.

Frontiers in Public Health, vol. 10.

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Keywords: Health hazard; insomnia; occupational health management; sleep disorder; work condition.

Evidence Level: 4B

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2022.866750/full>

COVID-19 outbreak rates and infection attack rates associated with the workplace: A descriptive epidemiological study

Background: A large number of COVID-19 outbreaks/clusters have been reported in a variety of workplace settings since the start of the pandemic but the rate of outbreak occurrence in the workplace has not previously been assessed. The objectives of this paper are to identify the geographical areas and industrial sectors with a high rate of outbreaks of COVID-19 and to compare infection attack rates by enterprise size and sector in England. **Methods:** Public Health England (PHE) HPZone data on COVID-19 outbreaks in workplaces, between 18 May and 12 October 2020, were analysed. The workplace outbreak rates by region and sector were calculated, using National Population Database (NPD) with the total number of workplaces as the denominator. The infection attack rates were calculated by enterprise size and sector using PHE Situations of Interest data with the number of test-confirmed COVID-19 cases in a workplace outbreak as the numerator and using NPD data with the number employed in that workplace as the denominator.

Results: The highest attack rate was for outbreaks in close contact services (median 16.5%), followed by outbreaks in restaurants and catering (median 10.2%), and in manufacturers and packers of non-food products (median 6.7%). The overall outbreak rate was 66 per 100 000 workplaces. Of the nine English regions, the North West had the highest workplace outbreak rate (155 per 100 000 workplaces). Of the industrial sectors, manufacturers and packers of food had the highest outbreak rate (1672 per 100 000), which was consistent across seven of the regions. In addition, high outbreak rates in warehouses were observed in the East Midlands and the North West. **Conclusions:** Early identification of geographical regions and industrial sectors with higher rates of COVID-19 workplace outbreaks can inform interventions to limit transmission of SARS-CoV-2.

Chen et al. 2022.

BMJ Open, vol. 12, no. 7.

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Keywords: COVID-19; epidemiology; occupational & industrial medicine; public health.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9296995/>

Association of smartphone-recorded steps over years and change in cardiovascular risk factors among working-age adults

Background: Few data exist on long-term steps and their relation to changes in cardiovascular disease risk factors. We aimed to examine the associations using long-term smartphone-recorded steps. **Methods and**

Results: The present analysis made use of data from 2 national databases and a commercial app database. We evaluated the associations between smartphone-recorded daily steps over 2 years and 2-year changes in the cardiovascular disease risk factors. A total of 15 708 participants with mean (SD) age of 44.1 (9.5) and 23.5% women were included. After adjustment for potential confounders, differences in weight were almost linearly associated with 2-year steps in men (estimate [SE] per 1000 steps/d: -0.33 [0.029] kg), and inversely related only above 5000 steps/d in women (-0.18 [0.054] kg). An inverse linear association with systolic blood pressure was observed in men (-0.34 [0.097] mm Hg) but not in women. Greater steps were

associated with change in high-density lipoprotein cholesterol and triglycerides (0.61 [0.068] and -3.4 [0.61] mg/dL in men; 0.64 [0.17] and -2.3 [0.67] mg/dL in women), while changes in low-density lipoprotein cholesterol were evident in men only (-0.59 [0.17] mg/dL). A significant negative association with hemoglobin A1c was observed only in women (-0.012 [0.0043] %). **Conclusions:** In a large cohort of Japanese adults, smartphone-recorded steps over years were associated with beneficial changes in cardiovascular disease risk factors, with some differences between men and women in the associational patterns. The findings support the benefit of long-term physical activity for cardiovascular disease health and suggest a useful role of smartphone-recorded steps for monitoring cardiovascular disease risk over the long term.

Hamaya et al. 2022.

Journal of the American Heart Association, vol. 11, no. 14.

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Keywords: Cardiovascular disease; glucose metabolism; mobile health; physical activity; smartphone; step counts; weight loss.

Evidence Level: 4A

Link: <https://www.ahajournals.org/doi/10.1161/JAHA.121.025689>

Occupational difference in oral health status and behaviors in Japanese workers: A literature review

Background: The occupational environment is an important factor for oral health because people spend a long time in the workplace throughout their lives and are affected by work-related stress and occupational health policies. **Methods:** This study aimed to review evidence for the association between occupation and oral health status and behaviors. A literature search of PubMed was conducted from February to May 2022, as well as a manual search analyzing the article origins. Articles were screened and considered eligible if they met the following criteria: (1) published in English; (2) epidemiological studies on humans; and (3) examined the association between occupation and oral health status and behaviors. **Results:** All 23 articles identified met the eligibility criteria. After full-text assessments, ten articles from Japan were included in this review: four on the association between occupation and dental caries, three on occupation and periodontal disease, two on occupation and tooth loss, and one on occupation and oral health behaviors. An association was apparent between occupation, oral health status and behaviors among Japanese workers. In particular, skilled workers, salespersons, and drivers who work longer hours and often on nightshifts, tended to have poor oral health.

Irie et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 13.

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Keywords: Japan; occupation; oral health behavior; oral health status.

Evidence Level: 6A

Link: <https://www.mdpi.com/1660-4601/19/13/8081>

The association between working hours flexibility and well-being prior to and during COVID-19 in South Korea

Background: This study examined the relationship between the flexibility of work schedule arrangements and well-being among full-time workers prior to and after the coronavirus disease (COVID-19) outbreak in South Korea. **Methods:** Data from the fifth 2017 and sixth 2020-2021 Korean Working Conditions Survey, including a final sample of 45,137 participants (22,460 males; 22,677 females), were used. Multiple logistic regression was performed to establish the association between schedule arrangement types and the 5-item World Health Organization Well-Being Index. **Results:** The study found an association between flexible schedule arrangements and good well-being in 2017: "little flexibility" (odds ratio (OR), 1.33; 95% confidence interval (CI), 1.27-1.48), "moderate flexibility" (OR, 1.48; 95% CI, 1.28-1.71), and "high flexibility" (OR, 1.35; 95% CI, 1.06-1.72). During COVID-19, only workers with "high flexibility" were likely to have good well-being (OR, 1.49; 95% CI, 1.18-1.88), while the association between well-being and "low flexibility" (OR, 1.06; 95% CI, 0.96-1.17) and "moderate flexibility" types (OR, 0.66; 95% CI 0.59-0.75) decreased. This study found that flexible working hours may contribute to better well-being among full-

time workers. However, the impact of the COVID-19 pandemic on working conditions and employee well-being should be addressed while setting working hours.

Nerobkova et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: COVID-19; WHO-5; flexible working hours; well-being; working condition survey.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/14/8438>

Work Health and Safety

This month we explore the effectiveness of an ergonomics intervention program with a participatory approach, the injury rates in military personnel and the perspectives of highly educated immigrant workers of occupational health and safety and work conditions. In Covid-19 related research studies present the relationship between occupation and Covid-19 mortality and the workplace perceptions and experiences related to Covid-19 response efforts among public health workers.

Highly educated immigrant workers' perspectives of occupational health and safety and work conditions that challenge work safety

Background: This study explored the perspectives of new immigrant workers regarding occupational health and safety and workplace conditions that increase workers' vulnerability to sustaining injury or illness.

Methods: Using an interpretive research approach and semi-structured qualitative interviews, 42 new immigrant workers from a range of industries operating in two cities in a province in Canada were interviewed. **Results:** Seventy-nine percent of the workers were highly qualified. A constant comparative approach was used to identify key themes across the workers' experiences. The findings revealed that new immigrant workers have an incomplete understanding of occupational health and safety. In many workplaces, poor job training, little worker support, lack of power in the workplace, and a poor workplace safety culture make it difficult for workers to acquire occupational health and safety information and to implement safe work practices. **Conclusion:** This study proposes workplace policies and practices that will improve worker occupational health and safety awareness and make workplaces safer for new immigrant workers.

Shankar et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: Highly qualified; new immigrant workers; occupational health and safety; policy; practice; workplace challenges.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/14/8757>

Injury rates in female and male military personnel: A systematic review and meta-analysis

Background: An effective military force is required to be agile, capable, efficient, and potent. Injuries to military personnel interrupt active-duty service and can detract from overall capability. These injuries are associated with a high individual and organizational burden, with lost work time and financial costs—all problematic for the ongoing functioning of a military force. Injury control strategies have therefore been described as force multipliers. Female personnel form an integral part of any modern defence force, but little research has examined their specific experiences of injury, to inform targeted injury control efforts. The aim of this review was to identify and synthesise findings from studies of injury rates and patterns in female military personnel, comparing them to those of male personnel. **Methods:** A systematic search was conducted for studies which compared injury rates between the sexes at any stage of military service, from basic training through to deployment. Databases searched included PUBMED, CINAHL and Medline through OVID. Methodological quality of eligible articles was assessed using the Critical Appraisal Skills Program

(CASP), and AXIS tools and data were extracted, synthesized, and, where possible, underwent meta-analysis. **Results:** Of 2287 identified studies, a total of 25 studies were eligible and included. Methodological quality ranged from 60% up to a perfect score of 100%, with an average of 82% across all studies. Relative risks for injuries (reported as RR [95%CI]) to females when compared to males were 2.10 [1.89-2.33] during basic training, 1.70 [1.33-2.17] during officer training, and 1.23 [1.05-1.43] post initial training. After adjustment for differences between the sexes in average fitness levels (2-mile run time), there was no longer a significant difference in injury rates (adjusted RR: 0.95 [0.86-1.05]). Female personnel tended to make bigger improvements in their fitness during basic training than males and tended to report their injuries more frequently and sooner than males. **Conclusion:** While this review found a higher rate of reported injuries in female military personnel when compared to male personnel, differences between the sexes in average fitness levels and injury reporting behaviours may largely explain this rate difference. The difference in rates of reported injuries was greatest during basic training, and reduced thereafter, possibly due in part to a reduced difference in fitness between the sexes or increased opportunity to self-determine workloads relative to fitness levels.

Schram et al. 2022.

BMC Womens Health, vol. 22, no. 1.

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Keywords: Army; defence; tactical; women.

Evidence Level: 1A

Link: <https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-022-01899-4>

Workplace perceptions and experiences related to COVID-19 response efforts among public health workers - Public health workforce interests and needs survey, United States, September 2021-January 2022

Background: The COVID-19 pandemic has strained many essential frontline professionals, including public health workers*; however, few studies have evaluated the specific challenges facing public health workers during this period. **Methods:** Data from the 2021 Public Health Workforce Interests and Needs Survey (PH WINS), a nationally representative survey of individual state and local governmental public health agency workers, provide insight into public health workers' demographic characteristics and experiences during the COVID-19 pandemic, tenure, and intention to leave their organization† (1). **Results:** Surveyed governmental public health workers identified predominantly as non-Hispanic White (White), women, and aged >40 years; however, workforce characteristics differed by agency type. Overall, 72% of respondents reported working fully or partially in a COVID-19 response role at any point during March 2020-January 2022. An estimated 44% of workers reported that they were considering leaving their jobs within the next 5 years for retirement or other reasons. Of those considering leaving, 76% began thinking about leaving since the start of the COVID-19 pandemic. When asked what was needed, besides funding, to respond to the COVID-19 pandemic, 51% selected additional staff capacity. **Conclusion:** Survey findings highlight the importance of focused attention on recruitment and retention that promotes diversity (2) and workers with public health experience, which will be critical as the workforce rebuilds as the COVID-19 pandemic evolves.

Hare Bork et al. 2022.

Morbidity and Mortality Weekly Report, vol. 71, no. 29.

Keywords: COVID-19; workplace; public health workers; frontline workers.

Evidence Level: 4B

Link: https://www.cdc.gov/mmwr/volumes/71/wr/mm7129a3.htm?s_cid=mm7129a3_w

Occupation and COVID-19 mortality in England: A national linked data study of 14.3 million adults

Background: To estimate occupational differences in COVID-19 mortality and test whether these are confounded by factors such as regional differences, ethnicity and education or due to non-workplace factors, such as deprivation or prepandemic health. **Methods:** Using a cohort study of over 14 million people aged 40-64 years living in England, we analysed occupational differences in death involving COVID-19, assessed between 24 January 2020 and 28 December 2020. We estimated age-standardised mortality rates (ASMRs) per 100 000 person-years at risk stratified by sex and occupation. We estimated the effect of

occupation on COVID-19 mortality using Cox proportional hazard models adjusted for confounding factors. We further adjusted for non-workplace factors and interpreted the residual effects of occupation as being due to workplace exposures to SARS-CoV-2. **Results:** In men, the ASMRs were highest among those working as taxi and cab drivers or chauffeurs at 119.7 deaths per 100 000 (95% CI 98.0 to 141.4), followed by other elementary occupations at 106.5 (84.5 to 132.4) and care workers and home carers at 99.2 (74.5 to 129.4). Adjusting for confounding factors strongly attenuated the HRs for many occupations, but many remained at elevated risk. Adjusting for living conditions reduced further the HRs, and many occupations were no longer at excess risk. For most occupations, confounding factors and mediators other than workplace exposure to SARS-CoV-2 explained 70%-80% of the excess age-adjusted occupational differences. **Conclusions:** Working conditions play a role in COVID-19 mortality, particularly in occupations involving contact with patients or the public. However, there is also a substantial contribution from non-workplace factors.

Nafilyan et al. 2022.

Occupational and Environmental Medicine, vol. 79, no. 7.

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(<https://creativecommons.org/licenses/by-nc/4.0/>)

Keywords: COVID-19; occupational health.

Evidence Level: 4B

Link: <https://oem.bmj.com/content/79/7/433.long>

Assessing the effectiveness of an ergonomics intervention program with a participatory approach: ergonomics settlement in an Iranian steel industry

Background: Work-related musculoskeletal disorders (WMSDs) are common occupational problems affecting the health and productivity of workers worldwide. Ergonomic intervention programs (EIPs) can play an effective role in preventing these disorders in the workplace. Assessing the effectiveness of an EIP is a challenge faced by both industries and researchers. This study was aimed at assessing the effectiveness of an EIP on human resources productivity (HRP), musculoskeletal disorders (MSDs), general health and occupational fatigue in a steel industry. **Methods:** This study was conducted in a steel industry in Isfahan, Iran, between 2018 and 2021. To assess the effectiveness of the EIP with a participatory approach, training and redesign of workstations, the criteria of HRP, MSDs, general health and occupational fatigue were investigated before and after the intervention, using HRP Questionnaire, Nordic musculoskeletal questionnaire (NMQ), 28-item General Health Questionnaire (28-GHQ), Swedish Occupational Fatigue Inventory (SOFI-20) and Occupational Fatigue/Exhaustion Recovery (OFER-15) Questionnaire, as data collection tools, respectively. **Results:** The implementation of EIP in the studied industry significantly led to an increase in HRP ($p < 0.05$). The prevalence of MSDs decreased significantly in most regions of the body after the interventions ($p < 0.001$). In addition, the program significantly improved general health ($p < 0.001$) and reduced occupational fatigue among employees ($p < 0.001$). **Conclusions:** The implementation of EIP was significantly effective in working conditions improvement. Therefore, implementing EIP with participatory approach, workforce training, as well as redesigning of workstations are recommended in industries.

Rostami et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 5.

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Keywords: General health; human resources productivity; musculoskeletal disorders; occupational fatigue; participatory ergonomics intervention program.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007/s00420-021-01811-x>

Risk Assessment

Differences between men and women in their risk of work injury and disability: A systematic review

Background: Health responses associated with occupational exposures can vary between men and women.

Aims: This study reviewed the work injury and disability risks associated with similar types of occupational exposures for men and women within and across occupations. **Materials & methods:** A systematic review was undertaken of observational studies published between 2009 and 2019. Studies were required to empirically compare men and women for associations between occupational exposures and work injury or disability outcomes. Included studies were appraised for methodological quality and medium to high rated studies were compared for risk differences between men and women. **Results:** Of 14,006 records identified, 440 articles were assessed for methodological quality, and 33 medium to high rated studies were included and reviewed. Among all occupations, the association between physical exposures, job demands, noise, and repetitive tasks, and injury risk were stronger among men. The relationship between repetitive tasks and sickness absence was stronger among women. Most studies examining psychological exposures found no risk differences for men and women across occupations. Men were at higher injury risk in certain occupations in primary and secondary industry sectors involving physical exposures and some chemical/biological exposures. Women were at higher injury risk for the physical demands and repetitive tasks of health care and aluminum production occupations. **Conclusion:** This review found that men and women can have different work injury and disability risks, both across and within the same occupations, for some physical exposures and to a lesser extent for some chemical and biological exposures. These differences might be a result of occupation-specific task differences.

Biswas et al. 2022.

American Journal of Industrial Medicine, vol. 65, no. 7.

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(<https://creativecommons.org/licenses/by-nc-nd/4.0/>)

Keywords: Gender; occupational exposures; sex; systematic review; work disability; work injury.

Evidence Level: 1A

Link: <https://onlinelibrary.wiley.com/doi/10.1002/ajim.23364>

Chronic Health Issues

This month we explore occupational issues for workers with systematic lupus erythematosus cardiovascular diseases and multiple sclerosis. Other studies explore the effect of self-employment on women's cardiovascular health and the influence of chronic diseases and poor working conditions in working life expectancy among older employees.

Work participation in patients with systematic lupus erythematosus: A systematic review

Background: This systematic review assessed which variables are associated with or are predictors for work participation outcomes in patients with systematic lupus erythematosus (SLE). **Methods:** A literature search using MEDLINE, The Cochrane Library, Embase and CINAHL was conducted to identify all studies published from inception (1947) to June 2021 on factors related to and/or predicting employment status, absenteeism and/or presenteeism in SLE patients aged ≥ 18 years. The quality of included articles was assessed using the QUIPS tool. Narrative summaries were used to present the data. **Results:** Fifteen studies (nine on associations, four on predictions, and two assessing both) were included, encompassing data of 3800 employed patients. Younger age, Caucasian ethnicity, higher educational level, lower disease activity score, shorter disease duration, absence of specific disease manifestations, higher levels of physical functioning and less physical job demands and higher levels of psychological/cognitive functioning were associated with or predicted favorable work outcomes. Older age, non-Caucasian ethnicity, female gender, never being married, poverty, lower educational level, higher disease activity score, longer disease duration, specific disease manifestations, lower levels of physical functioning, more physical job demands and low job control, less job tenure and lower levels of cognitive functioning were associated with or predicted an unfavorable work outcome. Limitations of the evidence were the quality of the studies and the use of heterogeneous outcome measures, applied statistical methods and instruments used to assess work participation. **Conclusion:** We recommend applying the EULAR points to consider for designing, analysing and reporting on work participation in inflammatory arthritis also to SLE studies on work

participation, to enhance the quality and comparability between studies and to better understand the impact of SLE on work participation.

Blomjous et al. 2022.

Rheumatology, vol. 61, no. 7.

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Keywords: Absenteeism; employment; prediction; presenteeism; systemic lupus erythematosus; work participation.

Evidence Level: 1A

Link: <https://academic.oup.com/rheumatology/article/61/7/2740/6430999?login=false>

Work exposures and development of cardiovascular diseases: A systematic review

Background: Cardiovascular diseases (CVDs) are the number one cause of death, and there is evidence that work exposures could be associated with their development. This study aimed to systematically review observational studies of adults exposed to job strain, effort-reward imbalance, long working hours, job insecurity, shift work, and occupational noise, and assess the association of those work exposures with CVDs. **Methods:** The Navigation Guide framework was applied. The population were adults of working age (18-65), and cohort and case-control studies were included. The work exposures were job strain, effort-reward imbalance, long working hours, job insecurity, shift work, and occupational noise. The outcomes were cerebrovascular diseases, ischaemic heart disease, and hypertensive diseases. The selection, data extraction, risk of bias assessment, and quality assessment were carried out by two reviewers independently and disagreements were solved by a third reviewer or by consensus. The synthesis of the results was done by applying the 'vote counting based on direction' method, and the results were summarized in an effect direction plot. The strength of the evidence for every risk factor and CVD was defined by consensus. **Results:** A total of 17 643 papers were initially identified in the literature search, but after applying the filters by title and abstract, and full text, 86 studies were finally included. From the included studies, sufficient evidence was found of the harmfulness of job strain for cerebrovascular disease and ischemic heart disease. Furthermore, there was sufficient evidence of the harmfulness of shift work for ischemic heart disease. Evidence of no relationship was found between long working hours and shift work with ischaemic heart disease and hypertensive disease, respectively. The other associations of work exposures and CVDs had limited or inadequate evidence of harmfulness. **Conclusions:** In this comprehensive review, there was sufficient evidence of a harmful relationship between job strain, shift work, and CVDs. For the other work exposures, more high-quality studies are needed. In order to improve current prevention strategies for CVDs, the findings of this review imply that job strain and shift work are work exposures that constitute additional risk factors that could be approached as targets for worksite interventions.

Moretti Anfossi et al. 2022.

Annals of Work Exposures and Health, vol. 66, no. 6.

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(<https://creativecommons.org/licenses/by-nc/4.0/>)

Keywords: Cardiovascular disease; effort–reward imbalance; job insecurity; job strain; long working hours; occupational noise; shift work; systematic review.

Evidence Level: 1A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9250287/>

Exploring the relationship between self-employment and women's cardiovascular health

Background: Compared with wage and salary work, self-employment has been linked to more favorable cardiovascular health outcomes within the general population. Women comprise a significant proportion of the self-employed workforce and are disproportionately affected by cardiovascular disease. Self-employed women represent a unique population in that their cardiovascular health outcomes may be related to gender-specific advantages of non-traditional employment. To date, no studies have comprehensively explored the association between self-employment and risk factors for cardiovascular disease among women. **Methods:** We conducted a weighted cross-sectional analysis using data from the University of

Michigan Health and Retirement Study (HRS). Our study sample consisted of 4624 working women (employed for wages and self-employed) enrolled in the 2016 HRS cohort. Multivariable linear and logistic regression were used to examine the relationship between self-employment and several self-reported physical and mental health risk factors for cardiovascular disease, controlling for healthcare access. **Results:** Among working women, self-employment was associated with a 34% decrease in the odds of reporting obesity, a 43% decrease in the odds of reporting hypertension, a 30% decrease in the odds of reporting diabetes, and a 68% increase in the odds of reporting participation in at least twice-weekly physical activity ($p < 0.05$). BMI for self-employed women was on average 1.79 units lower than it was for women working for wages ($p < 0.01$). **Conclusions:** Employment structure may have important implications for cardiovascular health among women, and future studies should explore the causal relationship between self-employment and cardiovascular health outcomes in this population.

Dzodzomenyo et al. 2022.

BMC Womens Health, vol. 22, no. 1.

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Keywords: Cardiovascular disease; employment status; women's health.

Evidence Level: 4B

Link: <https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-022-01893-w>

The influence of chronic diseases and poor working conditions in working life expectancy across educational levels among older employees in the Netherlands

Background: This study aims to estimate the influence of chronic diseases and poor working conditions - across educational levels - on working life expectancy (WLE) and working years lost (WYL) in the Dutch workforce after age 50. **Methods:** Information on demographics, chronic diseases, and working conditions from 11 800 Dutch workers aged 50-66 years participating in the Study on Transitions in Employment, Ability and Motivation (STREAM) from 2010/2015 was enriched with monthly information on employment status from Statistics Netherlands up to 2018. In a multistate model, transitions were calculated between paid employment and involuntary exit (disability benefits, unemployment) and voluntary exit (economic inactivity, early retirement) to estimate the impact of education, chronic diseases, and working conditions on WLE and WYL between age 50 and 66. **Results:** Workers with a chronic disease (up to 1.01 years) or unfavorable working conditions (up to 0.63 years) had more WYL due to involuntary pathways than workers with no chronic disease or favorable working conditions. The differences in WYL between workers with and without a chronic disease were slightly higher among workers with a lower education level (male: 0.85, female: 1.01 years) compared to workers with a high educational level (male: 0.72, female: 0.82 years). Given the higher prevalence of chronic diseases and unfavorable working conditions, WYL among lower educated workers were higher than among higher educated workers. **Conclusions:** The presence of a chronic disease or unfavorable working conditions, more prevalent among lower educated workers, contribute substantially to WYL among older workers. This will increase educational inequalities in working careers.

Schram et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 48, no. 5.

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Keywords: Chronic disease; working conditions; life expectancy; older employees; Netherlands.

Evidence Level: 4B

Link: <https://www.sjweh.fi/article/4028>

Occupational outcomes of people with multiple sclerosis: A scoping review

Background: To update the knowledge on the occupational outcomes associated with multiple sclerosis (MS), systematically examine the extent, scope and nature of the pre-existing literature and identify research gaps in the existing literature. **Design:** Scoping review. **Data sources:** A comprehensive database search of PubMed/MEDLINE, Scopus, SciVerse ScienceDirect and Web of Science was performed. There were no time limits. **Eligibility criteria:** We included any peer-reviewed original article reporting the occupational outcomes of people with MS between the ages of 18 and 65 years. We excluded those off-topic and with insufficient information. **Methods:** This review was conducted following the Joanna Briggs

Institute recommendations and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for scoping review checklist. Screening, reading of full-texts and data extraction was performed in a standardised way by expert reviewers from 14 July 2021 to 31 October 2021. We provided a narrative synthesis and an overview of findings. **Results:** The initial systematic search yielded 104 228 results. After removing duplicates and applying the exclusion criteria, 403 articles were included in the review. In total, the studies evaluated 492 062 subjects with MS. One hundred fifty-four (38.2%) articles were published in the last 5 years, mostly from Europe and North America (50.9% and 33.0%, respectively). Concerning the occupational outcomes, studies mostly addressed unemployment (311, 77.2%), early retirement (120, 29.8%), disability pension (117, 29.0%), sick leave (77, 19.1%), the indirect cost of MS (74, 18.4%) and work characteristics (57, 14.1%). The results were categorised into seven subtopics: 'Changes in work and occupational status due to MS', 'work-related socio-economic consequences of MS', 'risk factors for unfavourable occupational outcomes', 'reported barriers to employment', 'reported job accommodations and vocational rehabilitation strategies', 'job satisfaction, stigma, and disclosing the diagnosis in the workplace' and 'rating clinical scales'. **Conclusions:** There are several issues that deserve further in-depth study by the scientific community in order to improve the occupational outcomes of people with MS.

Vitturi et al. 2022.

BMJ Open, vol. 12, no. 7.

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Keywords: Epidemiology; health economics; multiple sclerosis; neurology; occupational & industrial medicine; public health.

Evidence Level: 6A

Link: <https://bmjopen.bmj.com/content/12/7/e058948.long>

Occupational Exposure

This month studies explore the occupational exposure to melamine and its derivatives in e-waste dismantling, occupational coal and silica dust, metal fumes and dust, BTEX and styrene, cleaning agents, bisphenols and derivatives in greenhouse dust and pollutants at fire scenes. Other areas related to occupational exposure explored include vector-borne pathogens in outdoor workers air pollution and workplace choice, the impact of occupational noise exposure on hyperacusis, the association between reported work in cold environments and stroke occurrence and workers' perception of heat stress during the COVID-19 pandemic.

Workers' perception heat stress: Results from a pilot study conducted in Italy during the COVID-19 pandemic in 2020

Background: Many workers are exposed to the effects of heat and often to extreme temperatures. Heat stress has been further aggravated during the COVID-19 pandemic by the use of personal protective equipment to prevent SARS-CoV-2 infection. However, workers' risk perception of heat stress is often low, with negative effects on their health and productivity. **Methods:** The study aims to identify workers' needs and gaps in knowledge, suggesting the adaptation of measures that best comply with the needs of both workers and employers. A cross-sectional online questionnaire survey was conducted in Italy in the hottest months of 2020 (June-October) through different multimedia channels. The data collected were analyzed using descriptive statistics; analytical tests and analysis of variance were used to evaluate differences between groups of workers. In total, 345 questionnaires were collected and analyzed. **Results:** The whole sample of respondents declared that heat is an important contributor to productivity loss and 83% of workers did not receive heat warnings from their employer. In this context, the internet is considered as the main source of information about heat-related illness in the workplace. **Conclusions:** Results highlight the need to increase workers' perception of heat stress in the workplace to safeguard their health and productivity. About two-thirds of the sample stated that working in the sun without access to shaded areas, working indoors without adequate ventilation, and nearby fire, steam, and hot surfaces, represent the main injuries' risk factors.

Bonafede et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 13.

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Keywords: Heat exposure; heat stress prevention measures; occupational injuries; risk knowledge; risk perception.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/13/8196>

Identification of bisphenols and derivatives in greenhouse dust as a potential source for human occupational exposure

Background: Bisphenol A (BPA) and alternative bisphenols are widely used in the industrial production of polycarbonates and resin polymers. Adverse effects on human health have been described for BPA and owing to the structural similarity of alternative bisphenols and derivatives, a similar toxicity profile is expectable. Dust can act as a sink for bisphenols owing to the large surface area to mass ratio. Human risk exposure to bisphenols via indoor dust has been widely assessed in the last decade. The environmental conditions inside greenhouses, among other factors, facilitate that chemicals are released from greenhouse building materials to dust. **Methods:** This study aims to explore for the first time the potential of greenhouse dust as a new source of bisphenols for human exposure. For this purpose, a supramolecular solvent-based method was applied to the extraction of twenty-one bisphenols from greenhouse dust, prior to their determination by liquid chromatography-tandem mass spectrometry. **Results:** Nineteen bisphenols were found in the five greenhouse dust samples analysed, with concentrations ranging from 5275 ng g⁻¹ (BPA) to 0.25 ng g⁻¹ (trichlorobisphenol A). The average daily dose (ADD) via dust ingestion for bisphenol compounds was calculated, in order to estimate the occupational exposure for inadvertent dust ingestion. Despite the calculated ADD value for BPA (47.81 ng kg⁻¹ day⁻¹) being below the tolerable daily intake proposed by EFSA (4·103 ng kg⁻¹ day⁻¹), this value was considerably higher than those previously reported for indoor dust, which brings to light the importance of considering greenhouse dust as bisphenols source of exposure for greenhouse workers.

Caballero-Casero et al. 2022.

Analytical and Bioanalytical Chemistry, vol. 414, no. 18.

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Keywords: Bisphenols; Greenhouse dust; Liquid chromatography–tandem mass spectrometry; Occupational exposure; Risk assessment; Supramolecular solvent.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007/s00216-021-03863-x>

Occupational exposure among electronic repair workers in Ghana

Background: Electronic repair workers may be exposed to lead, mercury, cadmium and other elements including rare earth elements used in electronic equipment. **Methods:** In this study, repair work took place in small repair shops where, e.g., televisions, radios, video players, compact discs and computers were repaired. Personal full-shift air samples of particulate matter were collected among 64 electronic repair workers in Kumasi (Ghana) and analysed for 29 elements by inductively coupled plasma mass spectrometry. **Results:** Results showed that air concentrations of all elements were low. The highest air concentration was measured for iron with a geometric mean concentration and geometric standard deviation of $6.3 \pm 0.001 \mu\text{g}/\text{m}^3$. The corresponding concentration of Pb and Hg were $157 \pm 3 \text{ ng}/\text{m}^3$ and $0.2 \pm 2.7 \text{ ng}/\text{m}^3$, respectively. The cerium concentration of $5 \pm 2 \text{ ng}/\text{m}^3$ was the highest among the rare earth elements. Source apportionment with ranked principal component analysis indicated that 63% of the variance could be explained by the repair and soldering of electronic components such as batteries, magnets, displays and printed circuit boards. **Conclusions:** An association between concentrations of lead in the workroom air and lead in whole blood was found (Pearson's correlation coefficient $r = 0.42$, $p < 0.001$). There was, however, no statistically significant difference between whole blood lead concentrations in the workers and references indicating that lead did not exclusively originate from occupational exposure.

Ericksen Hammer et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: Electronic repair workers; exposure assessment; metals; rare earth elements; remanufacturing; soldering.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/14/8477>

Association between reported work in cold environments and stroke occurrence in the CONSTANCES cohort: A prospective study

Background: Cold environments are a potential risk factor for stroke. The aim of this study was to investigate the association between performing work tasks in cold environments and the occurrence of a first stroke event. **Methods:** From the French population-based cohort CONSTANCES ('*Cohorte des consultants des Centres d'exams de santé*' in French), we collected data from baseline questionnaires along with medical interviews on cardiovascular risk factors and reported exposure to cold temperatures (<10°C) at work. Exposures were categorised as rare (<2 hours/day), often (≥2 and <4 hours/day) and almost always (≥4 hours/day). Incidence of stroke was retrieved from the French National Health database. Bivariate and multivariable logistic regression models were used to assess the association between working in cold environments and the incidence of stroke. Stratified analyses on stroke types were also conducted. **Results:** There were 160 782 participants and 224 strokes (168 ischaemic and 76 haemorrhagic) included in our study. No significant increase in stroke was found for working in cold environments; the adjusted OR for often or almost always exposed was 1.14 (95% CI 0.46 to 2.84). **Conclusions:** This study did not reveal a significant excess risk of stroke for occupational exposures to low temperatures. Further studies are needed to better assess the effect of preventive measures and very low temperature on occurrence of cardiovascular diseases.

Fadel et al. 2022.

BMJ Open, vol. 12, no. 7.

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Keywords: Epidemiology; occupational & industrial medicine; stroke.

Evidence Level: 4B

Link: <https://bmjopen.bmj.com/content/12/7/e054198.long>

The impact of occupational noise exposure on hyperacusis: A longitudinal population study of female workers in Sweden

Background: The aim was to assess the risk of hyperacusis in relation to occupational noise exposure among female workers in general, and among women working in preschool specifically. **Design:** A retrospective longitudinal study was performed. Survey data were collected in 2013 and 2014 from two cohorts: randomly selected women from the population in region Västra Götaland, Sweden, and women selected based on having received a preschool teacher degree from universities in the same region. The final study sample included n = 8328 women born between 1948 and 1989. Occupational noise exposure was objectively assigned to all time periods from the first to the last reported occupation throughout working life, using the Swedish Job-Exposure Matrix (JEM) with three exposure intervals: <75 dB(A), 75 to 85 dB(A), and >85 dB(A). The JEM assigns preschool teachers to the 75 to 85 dB(A) exposure interval. The outcome hyperacusis was assessed by self-report using one question addressing discomfort or pain from everyday sounds. In the main analysis, a hyperacusis event was defined by the reported year of onset, if reported to occur at least a few times each week. Additional sensitivity analyses were performed using more strict definitions: (a) at least several times each week and (b) every day. The risk (hazard ratio, HR) of hyperacusis was analyzed in relation to years of occupational noise exposure, using survival analysis with frailty regression modeling accounting for individual variation in survival times which reflect, for example, noise exposure during years prior to onset. Occupational noise exposure was defined by the occupation held at year of hyperacusis onset, or the occupation held at the survey year if no event occurred. Models were adjusted for confounders including age, education, income, family history of hearing loss, and change of jobs due to noise. **Results:** In total, n = 1966 hyperacusis events between 1960 and 2014 were analyzed in the main analysis. A significantly increased risk of hyperacusis was found among women working in any occupation assigned to the 75 to 85 dB(A) noise exposure group [HR: 2.6, 95% confidence interval (CI): 2.4-2.9], compared with the reference group <75 dB(A). The risk was tripled among preschool teachers

specifically (HR: 3.4, 95% CI: 3.0-3.7), with the crude Kaplan-Meier curve showing a higher rate of onset early in the working life in preschool teachers compared with all the other exposure groups. The risk was increased, but not statistically significant in the main analysis, for the highest exposure group >85 dB(A), where only six hyperacusis events were identified (HR: 1.4, 95% CI: 0.6-3.1). In the sensitivity analysis, where hyperacusis was defined as occurring every day, the HR was significant also in the highest exposure group (HR: 3.8, 95% CI: 1.4-10.3), and generally slightly higher in the other exposure groups compared to the main analysis. **Conclusions:** This study indicates increased risk of hyperacusis already below the permissible occupational noise exposure limit in Sweden (85 dB LAeq,8h) among female workers in general, and in particular among preschool teachers. Prospective studies and less wide exposure intervals could confirm causal effects and assess dose-response relationships, respectively, although this study at present suggest a need for risk assessment, improved hearing prevention measures, and noise abatement measures in occupations with noise levels from 75 dB(A). The results could also have implications for management of occupational disability claims.

Fredriksson et al. 2022.

Ear and Hearing, vol. 43, no. 4.

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(<https://creativecommons.org/licenses/by-nc-nd/4.0/>)

Keywords: Noise exposure; occupational noise; female workers; Sweden.

Evidence Level: 4B

Link: https://journals.lww.com/ear-hearing/Fulltext/2022/07000/The_Impact_of_Occupational_Noise_Exposure_on.26.aspx

An overview of cleaning agents' health hazards and occupational injuries and diseases attributed to them in Sweden

Background and Methods: Using data from the Swedish Products Register, hosted by the Swedish Chemicals Agency (KemI), national occupational injury and disease statistics, and call records from the Swedish Poisons Information Centre (PIC) we characterize health hazards of marketed cleaning products and recorded injuries, disease, and incidents linked to cleaning or disinfection agents. **Results:** The results show that cleaning agents pose many kinds of health hazards, although corrosion and irritation hazards dominate, in particular for the eyes (54% of all included products). Few products were recognized as inhalation hazards. The nature of the health hazards is reflected in the occupational disease and injury statistics and PIC records for eyes and skin but not for the respiratory tract. Among occupational disease cases attributed to cleaning or disinfection agents, 61% concern skin and 26% the respiratory tract. Among occupational injury cases 64% concern chemical burns. However, only a small part (<0.5%) of all reported diseases and injuries were explicitly attributed to cleaning or disinfection agents. On average, there were 11 cases of disease attributed to cleaning or disinfection agents per million workers and year. For occupational injuries the corresponding number was 8. The data concern a broad range of sectors and occupations, but notable sectors were healthcare, accommodation and food service, and manufacturing. Women were more likely to suffer from disease, men and women equally likely to suffer from injury. PIC cases were evenly distributed between men and women, but the clear risk cases more frequently involved men. Occupational diseases increased many-fold in 2020 while injuries decreased, which could be due to COVID-19 changing use patterns of cleaning and disinfection agents at work. **Conclusion:** We conclude that cleaning agents pose a variety of risks to a large part of the workforce, although particular attention for preventive efforts may need to be directed to the healthcare, accommodation and food service, and manufacturing sectors.

Kathare et al. 2022.

Annals of Work Exposure and Health, vol. 66, no. 6.

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(<https://creativecommons.org/licenses/by-nc/4.0/>)

Keywords: Cleaning agents; detergents; disinfectants; occupational disease; occupational health and safety; occupational injury; poison control.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9250289/>

Air pollution and workplace choice: Evidence from China

Background: Understanding the impacts of air pollution on public health and individual behavior is crucial for optimal environmental policy design. **Methods:** Using 2015 census microdata in China, this paper examined the causal effect of air pollution on working place choice. The research design relies on a regression discontinuity design based on China's Huai River Policy. The discontinuity in air pollution caused by the Huai River Policy provides a natural experiment to estimate the impact of air pollution. **Results:** The results show that air pollution significantly increases the possibility of individuals working near home. The positive effect of air pollution on working near home is more significant for women, the elderly, urban individuals and those individuals working in secondary and tertiary industries. **Conclusion:** This study improves our understanding of the health effects and avoidance behavior associated with environmental hazards, discusses the negative impact of air pollution on labor mobility and mismatch by making individuals work nearby, and emphasizes that strengthening air pollution control should be a long-term policy.

Lin et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: China; air pollution; avoidance behavior; public health; regression discontinuity design; workplace.

Evidence Level: 51B

Link: <https://www.mdpi.com/1660-4601/19/14/8732>

Associations between awareness of the risk of exposure to pollutants occurring at fire scenes and health beliefs among metropolitan firefighters in the republic of Korea

Background: Firefighters are repeatedly exposed to various pollutants that occur at fire scenes. There are three levels of exposure: primary exposure to pollutants, secondary exposure to pollutants on personal protective equipment (PPE), and tertiary exposure to contaminated fire stations and fire engines due to pollutants on PPE. Therefore, it is important for firefighters to be aware of the risk of exposure to pollutants and to practice health behaviors such as appropriate PPE management. No clear association has been established in the existing literature between firefighters' risk perception level and their health beliefs about the health impact of awareness of exposure to hazardous substances at fire scenes. **Methods:** This study aims to evaluate the relationship between awareness of the exposure risk to primary, secondary, and tertiary pollutants and health beliefs. It was designed as a cross-sectional study, in which a web-based survey was conducted from 13 May to 31 May 2021. The analysis was conducted in 1940 firefighters working in the Seoul metropolis who agreed to participate in the research. **Results:** Participants who perceived susceptibility were likely to be aware of the primary (adjusted odds ratio (AOR) = 2.10, 95% confidence interval (CI) 1.16-3.80), secondary (AOR = 2.77, 95% CI 1.77-4.32), and tertiary (AOR = 2.73, 95% CI 1.85-4.03) exposure risks. Participants who perceived barriers were unlikely to be aware of the risk of exposure to primary (AOR = 0.67, 95% CI 0.49-0.91), secondary (AOR = 0.77, 95% CI 0.61-0.96), and tertiary (AOR = 0.75, 95% CI 0.62-0.91) pollutants. Educational intervention is recommended to improve perceived susceptibility and awareness of the risk of exposure to pollutants and reduce perceived barriers. Consequently, educational intervention is expected to positively impact firefighters' management of appropriate PPE. We confirmed an association between occupational exposure risk and firefighters' health beliefs. In the health belief model (HBM), health beliefs that affect health behavior also affect awareness of the exposure risk level. Therefore, an intervention for health beliefs can also be used to raise job-related exposure risk awareness. **Conclusion:** Regular training on the health impacts of fire scenes is necessary for both newcomers and incumbents to enable firefighters to better recognize the risks of each occupational exposure level. Additionally, laws and regulations are necessary for the removal of harmful substances that contaminate PPE, such as self-contained breathing apparatus (SCBA), during exposure to a fire scene. Our research can be used as a basis for improving fire policies and education programs in the future.

Oh et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 14.

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Keywords: Association; exposure risk awareness; fire scene; firefighter; health belief model; job-related exposure; personal protection equipment; pollutant; self-contained breathing apparatus.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/14/8860>

Occupational exposure to BTEX and styrene in West Asian countries: A brief review of current state and limits

Background: The aim of introducing occupational exposure limits (OELs) is to use them as a risk management tool in order to protect workers' health and well-being against harmful agents at the workplace. **Methods:** In this review we identify OELs for benzene, toluene, ethylbenzene, xylene (BTEX), and styrene concentrations in air and assess occupational exposure to these compounds through a systematic literature search of publications published in West Asian countries from 1980 to 2021. OELs for BTEX and styrene have been set in Iran and Turkey to levels similar to those in European countries and the US. **Results:** The search yielded 49 full-text articles that cover studies of exposure assessment in six countries, but most (n=40) regard Iran. Average occupational exposure to benzene of workers in oil-related industries is higher than recommended OEL, while average occupational exposure to other compounds is lower than local OELs (where they exist). **Conclusion:** Currently, information about levels of occupational exposure to BTEX and styrene is insufficient in West Asian countries, which should be remedied through OEL regulation and application. Furthermore, coherent research is also needed to determine actual levels of occupational exposure, dose-responses, and the economic and technical capacity of local industries to address current issues.

Rahimpoor et al. 2022.

Archives of Industrial Hygiene and Toxicology, vol. 73, no. 2.

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Keywords: OEL; benzen; benzene; ethylbenzene; etilbenzen; ksilen; naftna industrija; oil industry; risk management; toluen; toluene; upravljanje rizikom; xylene.

Evidence Level: 1B

Link: <https://sciencedirect.com/article/10.2478/aiht-2022-73-3634>

Seroprevalence of vector-borne pathogens in outdoor workers from southern Italy and associated occupational risk factors

Background: Vector-borne diseases (VBDs) represent an emerging global threat to public health due to the geographical expansion of arthropod vectors. The study aims to assess the seroprevalence of selected vector-borne pathogens (VBPs) in different groups of outdoor workers and the occupational risk factors for exposure to arthropod bites. **Methods:** A cross-sectional study was conducted on 170 workers recruited in two different regions of southern Italy, including farmers, forestry workers, veterinarians, geologists/agronomists and administrative employees, and tested for IgG antibodies against *Bartonella henselae*, *Borrelia* spp. *Coxiella burnetii* and *Rickettsia conorii*, using a chemiluminescent immunoassay (CLIA). The relationship among job characteristics, tick exposure and the prevalence of seropositive subjects for each pathogen was investigated by applying categorical principal component analysis (CATPCA). **Results:** A high seroprevalence for *C. burnetii* (30.0%) and *R. conorii* (15.3%) was reported, mainly in farmers (67.7% and 54.8%, respectively) and forestry workers (29.0% and 16.1%, respectively), while a low prevalence was observed for *B. henselae* and *Borrelia* spp. (8.8% and 4.1%, respectively). The regression equation by CATPCA was significant for *C. burnetii* and *R. conorii* ($P < 0.001$), showing a positive association with job, tick bite exposure, working area and contact with animals. **Conclusions:** These findings highlight the need of activating an appropriate occupational health response for minimizing the risk of arthropod vector exposure in workplaces, considering specific preventive measures in particular in high-risk job categories.

Stufano et al. 2022.

Parasites and Vectors, vol. 15, no. 1.

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Keywords: Chemiluminescent immunoassay; coxiella burnetii; farmers; public health; rickettsia conorii; tick borne pathogens; zoonosis.

Evidence Level: 4B

Link: <https://parasitesandvectors.biomedcentral.com/articles/10.1186/s13071-022-05385-6>

Pneumococcal pneumonia on the job: Uncovering the past story of occupational exposure to metal fumes and dust

Background: The objectives of this study are to elucidate the early history of risk for pneumococcal pneumonia from occupational exposure to metal fumes and dusts, and to demonstrate the importance of searching older literature when performing reviews. **Methods:** We performed manual searching for articles in the Library of the Surgeon General's Office (the precursor to Index Medicus), in the Hathi Trust database, in PubMed, and by screening reference lists in literature appearing before the introduction of PubMed.

Results: An early body of literature, from the 1890s onward, recognized that pneumonia was linked to "Thomas slag," a steel industry byproduct containing iron, manganese, and lime. Researchers, mainly in Germany, showed that workers in metal-dust-exposed occupations, especially using manganese, manifested an increased incidence of pneumococcal pneumonia. An outbreak of pneumococcal pneumonia in the 1930s implicated manganese fume in its etiology. In the immediate post-World War II period, there was a brief flurry of interest in pneumonia from exposure to potassium permanganate that was soon dismissed as a chemical pneumonitis. After a hiatus of two decades, epidemiologic investigations drew attention to the pneumonia risks of welding and related metal fume exposure, bringing renewed interest to the forgotten role of pneumococcal pneumonia as an occupational disease. Occupational or environmental inhalation of manganese, iron, or irritants may be causally related to increased pneumococcal pneumonia risk. In particular, the risk associated with manganese seems to be overlooked in recent literature.

Conclusion: An important conclusion is the importance of obtaining additional evidence through a deeper assessment of the literature in a broad historical context.

Torén et al. 2022.

American Journal of Industrial Medicine, vol. 65, no. 7.

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Keywords: History of medicine; industrial disease; manganese; metal fume; occupational health; welding.

Evidence Level: 6B

Link: <https://onlinelibrary.wiley.com/doi/10.1002/ajim.23352>

Understanding the pathogenesis of occupational coal and silica dust-associated lung disease

Background: Workers in the mining and construction industries are at increased risk of respiratory and other diseases as a result of being exposed to harmful levels of airborne particulate matter (PM) for extended periods of time. While clear links have been established between PM exposure and the development of occupational lung disease, the mechanisms are still poorly understood. A greater understanding of how exposures to different levels and types of PM encountered in mining and construction workplaces affect pathophysiological processes in the airways and lungs and result in different forms of occupational lung disease is urgently required. Such information is needed to inform safe exposure limits and monitoring guidelines for different types of PM and development of biomarkers for earlier disease diagnosis. Suspended particles with a 50% cut-off aerodynamic diameter of 10 µm and 2.5 µm are considered biologically active owing to their ability to bypass the upper respiratory tract's defences and penetrate deep into the lung parenchyma, where they induce potentially irreversible damage, impair lung function and reduce the quality of life. **Methods and Results:** Here we review the current understanding of occupational respiratory diseases, including coal worker pneumoconiosis and silicosis, and how PM exposure may affect pathophysiological responses in the airways and lungs. We also highlight the use of experimental models for better understanding these mechanisms of pathogenesis. **Conclusion:** We outline the urgency for revised dust control strategies, and the need for evidence-based identification of safe level exposures using clinical and experimental studies to better protect workers' health.

Vanka et al. 2022.

European Respiratory Review, vol. 31, no. 65.

User License:

Keywords: Lung disease; coal; silica dust; mining; construction; respiratory disease.

Evidence Level: 6A

Link: <https://err.ersjournals.com/content/31/165/210250.long>

E-waste dismantling-related occupational and routine exposure to melamine and its derivatives:

Estimating exposure via dust ingestion and hand-to-mouth contact

Background: Melamine (MEL) and its derivatives are increasingly applied as nitrogenous flame retardants in consumer products. Nevertheless, limited information is available on their environmental occurrence and subsequent human exposure via multiple exposure pathways. **Methods:** In this study, we analysed MEL and its derivatives in dust (indication of the dust ingestion route) and hand wipe samples (indication of the hand-to-mouth route) collected in various microenvironments. **Results:** The levels of Σ MELs in both dust (median: 24,100 ng/g) and participant hand samples (803 ng/m²) collected in e-waste dismantling workshops were significantly higher than those in samples collected in homes (15,600 ng/g and 196 ng/m², respectively), dormitories (13,100 ng/g and 227 ng/m², respectively) and hotel rooms (11,800 ng/g and 154 ng/m², respectively). Generally, MEL dominated in dust samples collected in e-waste dismantling workshops, whereas cyanuric acid dominated in hand wipe samples. This may occur partly because the latter is an ingredient in disinfection products, which are more frequently employed in daily lives during the COVID-19 pandemic. **Conclusion:** Exposure assessment suggests that dust ingestion is an important exposure pathway among dismantling workers and the general population, whereas hand-to-mouth contact could not be overlooked in certain populations, such as children and dismantling workers not wear gloves at work.

Zhao et al. 2022.

Environmental International, vol. 165.

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Keywords: Cyanuric acid; dust; e-waste dismantling; exposure pathway; hand wipes; melamine.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0160412022002264?via%3Dihub>

Sedentary Practices

Cost and cost-effectiveness of the 'Stand and Move at Work' multicomponent intervention to reduce workplace sedentary time and cardiometabolic risk

Background: Few studies have reported the cost and cost-effectiveness of workplace interventions to reduce sedentary time. The purpose of this study was to complete an economic evaluation of a multilevel intervention to reduce sitting time and increase light-intensity physical activity (LPA) among employees.

Methods: We conducted a retrospective within-trial cost and cost-effectiveness analysis (CEA) to compare a 12-month multilevel intervention with (STAND+) and without (MOVE+) a sit-stand workstation, across 24 worksites (N=630 employee participants) enrolled in a cluster randomized clinical trial. We estimated the intervention costs using activity-based costing strategy. The intervention costs were further expressed as per person and per worksite. CEA was conducted using an incremental cost-effectiveness ratio (ICER) metric, expressed as costs for additional unit of sitting time (minute/day), LPA (minutes/day), cardiometabolic risk score, and quality-adjusted life years (QALY) increased/decreased at 12 months. We assessed the cost analysis and CEA from the organizational (ie, employer) perspective with a one-year time horizon. **Results:** Total intervention costs were \$134 and \$72 per person, and \$3939 and \$1650 per worksite for the STAND+ (N worksites = 12; N employees = 354) and MOVE+ (N worksites = 12; N employees = 276) interventions, respectively. The ICER was \$1 (95% CI \$0.8-1.4) for each additional minute reduction of workplace sitting time (standardized to 8-hour workday); and \$4656 per QALY gained at 12 months. There was a modest and non-significant change of loss of work productivity improvement (-0.03 hours, 95% CI -4.16-4.09 hours), which was associated with a \$0.34 return for every \$1 invested.

Conclusions: The multi-level intervention with sit-stand workstations has the potential to be widely implemented to reduce workplace sitting time. Future research into work productivity outcomes in terms of cost-benefits for employers is warranted.

Michaud et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 48, no. 5.

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Keywords: Workplace interventions; cost effectiveness; sedentary.

Evidence Level: 2A

Link: <https://www.sjweh.fi/article/4022>

Musculoskeletal Health

This month we explore the impact of musculoskeletal pain and strenuous work on self-reported physical work ability and identify that pinch grip is not an occupational risk factor for the musculoskeletal system.

The impact of musculoskeletal pain and strenuous work on self-reported physical work ability: A cohort study of Swedish men and women

Objective: We investigated the separate and combined effects of musculoskeletal pain (MSP) and strenuous work (heavy physical workload (PWL)/low-decision authority) on poor physical work ability (WA).

Methods: This study uses baseline data from the 2010 Stockholm Public Health Questionnaire (SPHQ) including 9419 workers with good physical WA. Exposure to PWL and decision authority were estimated using sex-specific job-exposure matrices linked to occupations. Exposures (high/low) were combined with the presence of MSP. Follow-up data on physical WA were taken from the 2014 SPHQ and dichotomised (the responses: "moderate", "rather poor" and "very poor" indicated poor WA). Logistic regression models calculated sex-specific odds ratios adjusting for age, education and health and lifestyle factors. Interaction between MSP and strenuous work was examined using the synergy index (SI). Analyses were conducted using SPSS.27. **Results:** MSP, heavy PWL and low-decision authority were separately associated with poor WA. MSP was associated with higher odds of poor WA than strenuous work for women, the opposite for men. Combinations of MSP and strenuous work often resulted in higher risks of poor WA than when adding the effects of the single exposures (e.g., MSP and heavy PWL men: AOR 4.04 95% CI 2.00-8.15, women: AOR: 3.25 95% CI 1.81-5.83). The SI was non-significant for both sexes. **Conclusion:** Workers with MSP and strenuous work often had higher risks of poor WA than would be expected from adding the effects of the single exposures. To decrease poor WA in this group, strenuous work should be lowered, and MSP addressed in workplaces.

Badarin et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 5.

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Keywords: Epidemiology; ergonomics; job-exposure matrix; musculoskeletal disorders; work performance.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007/s00420-021-01816-6>

Pinch Grip per SE is not an occupational risk factor for the musculoskeletal system: An experimental study on field

Background: Some ergonomic evaluation methods define pinch grip as a risk factor independent of the exerted force. The present experimental study was performed with the main aim of objectively measuring the muscle engagement during the execution of pinch grip. **Methods:** The participants of the study were healthy workers occupationally involved in a high-intensity repetitive job related to the sorting of letters and small packages. Surface electromyography (sEMG) was used to study the activity of the abductor pollicis brevis and first dorsal interosseous fibers related to the execution of the required working tasks, while the force exerted during voluntary muscle contraction for pinch grip was measured by a portable acquisition system. The subjects were specifically asked to exert the maximum voluntary isometric contraction (MVIC) and further voluntary isometric contractions with a spontaneous force (SF) equal to 10%, 20% and 50% of the MVIC; finally, the workers were asked to hold in pinch grip two types of envelopes, weighing 100 g and 500 g, respectively. **Results:** The force required to pinch 100 and 500 g envelopes by the fifteen subjects of the study corresponded to 4 and 5% MVIC, respectively. The

corresponding sEMG average rectified values (ARV) were approximately 6% of that at MVIC for first dorsal interosseus (FDI) fibers and approximately 20-25% of MVIC for abductor pollicis brevis (ABP) fibers. Bivariate correlation analysis showed significant relationships between force at MVIC and FDI ARV at MCV. **Conclusions:** The obtained results demonstrate that muscle recruitment during pinch grip varies as a function of the SF: not only the position but also the exerted force should be considered when assessing the pinch grip as risk factor for biomechanical overload of the upper limb.

Sala et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 15.

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Keywords: EMG; finger grip; musculoskeletal overload risk assessment; pinch; strain; upper limb.

Evidence Level: 3A

Link: <https://www.mdpi.com/1660-4601/19/15/8975>