



Emerging Evidence Alert

May 2022

This Emerging Evidence Alert includes the latest peer-reviewed articles, reports and evidence published in April 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 return to work following work-related injuries in the construction industry, and more generally from a period of unemployment and from long sickness absence including mental health related sickness absence.

Health-related selection into employment among the unemployed

Background: Successful transitions from unemployment to employment are an important concern, yet little is known about health-related selection into employment. We assessed the association of various physical and psychiatric conditions with finding employment, and employment stability. **Methods:** Using total population register data, we followed Finnish residents aged 30-60 with an unemployment spell during 2009-2018 (n = 814,085) for two years from the onset of unemployment. We predicted any, stable, and unstable employment by health status using Cox proportional hazards models. The data on specialized health care and prescription reimbursement were used to identify any alcohol-related conditions and poisonings, psychiatric conditions and self-harm, injuries, and physical conditions. We further separated physical conditions into cancer, diabetes, heart disease, and neurological conditions, and psychiatric conditions into depression, anxiety disorders and substance use disorders. **Results:** The likelihood of any employment was lower among those who had any of the assessed health conditions. It was lowest among those with alcohol-related or psychiatric conditions with an age-adjusted hazard ratio of 0.45 (95% confidence interval 0.44, 0.46) among men and 0.39 (0.38, 0.41) among women for alcohol-related and 0.64 (0.63, 0.65) and 0.66 (0.65, 0.67) for psychiatric conditions, respectively. These results were not driven by differences in socioeconomic characteristics or comorbidities. All the included conditions were detrimental to both stable and unstable employment, however alcohol-related and psychiatric conditions were more harmful for stable than for unstable employment. **Conclusions:** The prospects of the unemployed finding employment are reduced by poor health, particularly alcohol-related and psychiatric conditions. These two conditions may also lead to unstable career trajectories. The selection process contributes to the health differentials between employed and unemployed people. Unemployed people with health problems may therefore need additional support to improve their chances of employment.

Junna et al. 2022.

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

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Keywords: Employment; health; longitudinal study; re-employment; unemployment.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13023-0>

Evaluating effectiveness of an integrated return-to-work and vocational rehabilitation program on work disability duration in the construction sector

Background: The aim of this study was to investigate whether an integrated return-to-work (RTW) and vocational rehabilitation (VR) program - the Work Reintegration (WR) program - was associated with reduced work disability duration in the construction sector in Ontario, Canada. **Methods:** Workers' compensation data from the Ontario Workplace Safety and Insurance Board were extracted for lost-time construction worker claims following work-related injuries between 2009 and 2015. Claims receiving referrals to RTW and VR specialists (treatments) were matched with claims receiving no referrals (controls) during the periods before and after the WR program introduction. Multivariable difference-in-differences linear and quantile regression models were used to examine differences in cumulative disability days paid during two-years post-injury between treatment and control groups before and after the program change and the difference in these differences, overall, and at different disability distribution percentiles.

Results: The WR program introduction was associated with reductions in cumulative disability days paid for all claims but most notably among longer duration claims referred to RTW specialists (reduction of 274 days at the 90th percentile in the disability distribution) and shorter duration claims referred to VR specialists (reductions of 255 and 214 days at the 25th and 50th percentiles in the disability distribution, respectively).

Conclusions: The WR program introduction was effective in reducing cumulative disability days paid for construction worker claims but the effects varied at different percentiles in the disability distribution, as well as by specialist referral. The findings highlight the benefits of better integrated RTW and VR services to injured workers in the construction sector.

Macpherson et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 48, no. 3.

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Keywords: Return to work; rehabilitaton; work disability; construction.

Evidence Level: 4B

Link: <https://www.sjweh.fi/article/4006>

Work and family characteristics as socioeconomic determinants in long sickness absence: The Japanese civil servants study

Background: Long sickness absence is more common among low socioeconomic status (SES) groups than high SES groups. This study aimed to evaluate whether work and family characteristics contribute to SES and sex differences in long sickness absence (7 days or more). **Methods:** The participants were 3080 civil servants working for a local Japanese government. **Results:** In both sexes, low-grade employees were likely to take long sickness absence, with a statistically significant association for men (age-adjusted OR of lowest-grade employees for long sickness absence: 2.30 (95% Confidence Interval (CI): 1.32-4.02)). After adjusting for all variables, SES differences in long sickness absence in men decreased to OR 1.98 (CI 1.10-3.55) but remained significant; in men, being without a spouse was significantly associated with long sickness absence. Employees working long hours had lower OR for long sickness absence after adjusting for all variables in both sexes. Conversely, poor sleep quality and longstanding illness significantly increased OR for long sickness absence. **Conclusion,** SES differences in sickness absence were explained partly by work and family characteristics, longstanding illness, and poor sleep quality; however, other factors that were not evaluated in this study may also be associated with SES differences.

Nose et al. 2022.

Industrial Health, vol. 60, no. 2.

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Keywords: Family characteristics; grade of employment; job stress; sickness absence; socioeconomic status; The JACS Study.

Evidence Level: 5B

Link: https://www.jstage.jst.go.jp/article/indhealth/60/2/60_2020-0234/article

Do baseline industry and job group skill level predict welfare dependency at 1, 3 and 5 years after mental health related sickness absence? A Danish cohort study

Background: The cost of mental ill health in the EU-28 nations has been estimated at approximately 4.1% of the total gross domestic products (GDP). Improved rates of return to sustainable employment among people who are sick-listed due to mental ill health would decrease spending on welfare benefits. The present cohort study provides statistical information that may be helpful in the design and prioritizing of efforts aimed at reducing the burden of sickness absence due to mental ill health among employees in the general working population of Denmark. Our primary aim was to estimate odds of being i) deceased or recipient of health related welfare benefits and ii) recipient non-health related welfare benefits, compared to being alive and self-reliant at 1, 3 and 5 years after first visit to a jobs and benefits office due to mental health related sickness absence, as a function of industrial sector and job group skill level at baseline. A secondary aim was to analyze these odds as a function of baseline age, gender, type of mental ill health, family type and employment status. **Methods:** The study population consisted of 20-54 year-old persons on long-term sickness absence due to mental health problems in 21 Danish municipalities in 2010-2012 (N = 19,660). Odds ratios were estimated by use of multinomial logistic regression. The outcomes were ascertained through national registers. **Results:** We did not find any statistically significant association between baseline industrial sector or job group skill level and welfare dependency at follow-up. In the secondary analyses, the estimated odds of health and non-health related welfare dependencies at follow-

up tended to increase with unemployment, age, being single and being on sick leave due to self-reported anxiety or depression versus stress/burnout at baseline. **Conclusions:** The present study does not support that industry and job group skill level predict welfare dependency after health related sickness absence, after adjustment for relevant covariates, in the general population of Denmark. It suggests, however, that the vulnerability lies in population groups characterized by unemployment, older age, being single and being on sick leave due to self-reported anxiety or depression versus stress/burnout.

Hannerz et al. 2022.

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

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Keywords: Industry; mental health; occupation; return to work; sick leave.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13105-z>

Presenteeism and Absenteeism

This month sees an exploration on the effects on absenteeism from a wide range of factors including the covid vaccine, work-related stress, knee and hip osteoarthritis, perceived supervisor support and the use of dialogue meetings (between employee, employer and doctor).

Presenteeism and absenteeism in the manufacturing sector: A multilevel approach identifying underlying factors and relations to health

Background: Presenteeism is problematic since it relates to lower health and productivity. Prior research examined many work and attitudinal variables relating to presenteeism at the individual level. Here, we conceptualize presenteeism as multilevel phenomenon also shaped by the overall attendance behavior (absenteeism and presenteeism) at the work unit. **Methods:** We surveyed employees at a manufacturing plant on presenteeism, health-related lost productive time (HLPT) and absenteeism ($N = 911$, 22 units) and collected preceding (past 12-7 and 6 months) objective absence data aggregating it at unit level. **Results:** Considering the individual-level antecedents only higher physical demands predicted higher absence duration. Presenteeism related positively to physical demands, a burdensome social environment, and organizational identification and negatively to ease of replacement, and core self-evaluations. These relationships were similar for HLPT as outcome. Regarding unit-level factors, preceding unit-level absence frequency (but not duration) negatively related to presenteeism. The negative relationship between core self-evaluations and individual presenteeism decreased under a stronger presenteeism context supporting the hypothesized cross-level effect of unit-level presenteeism context strength. Moreover, individual and unit-level presenteeism correlated, as expected, more strongly with health complaints than absenteeism. **Conclusion:** Our study demonstrates the value of a contextual, multilevel approach for understanding antecedents and consequences of attendance behavior.

Nowak et al. 2022.

Current Psychology, vol. 2, no. 1-19.

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Keywords: Absenteeism; context strength; core self-evaluations; health; multilevel; presenteeism.

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8976112/>

Work-related stress and future sick leave in a working population seeking care at primary health care centres: a prospective longitudinal study using the WSQ

Background: Studying the relationship between work-related stress and sick leave is valuable in identifying and assessing employees at risk of sick leave, but also in developing interventions and taking actions for workers' health. The overall aim of this study was to analyse the association between work-related stress, measured with the work stress questionnaire (WSQ), and registered sick leave in a working population seeking care at primary health care centres in Sweden. **Methods:** A prospective longitudinal study was performed with 232 employed patients aged 18-64 years seeking care for mental and/or physical health

complaints at seven primary health care centres. Bivariate logistic regression analysis adjusted for educational level, occupational class and marital status was performed using questionnaire data on work-related stress and sociodemographic factors collected between May 2015 until January 2016 together with registered sick leave data from a national database. **Results:** High stress due to indistinct organization and conflicts was reported by 21% (n = 49), while 45% (n = 105) reported high stress due to individual demands and commitment. Thirty-six percent were on sick leave for 15 days or more during 12 months after baseline. The odds of being on registered sick leave during this period was approximately twice as high for patients perceiving high stress due to indistinct organization and conflicts (OR 2.25, 95% CI 1.18;4.26), high stress due to individual demands and commitment (OR 2.21, 95% CI 1.28;3.82), low influence at work (OR 2.07, 95% CI 1.20;3.57), or high interference between work and leisure time (OR 2.19, 95% CI 1.27;3.80). Perceiving high stress due to both indistinct organization and conflicts as well as individual demands and commitment quadrupled the odds of sick leave, OR 4.15 (95% CI 1.84; 9.38). **Conclusions:** Work-related stress and sick leave were prevalent among the patients. Perceiving one or more of the work-related stressors and stress increased the odds of registered sick leave between two to four times. Hence, to capture the dynamic interaction between the individual and the work environment, a wide spectrum of factors must be considered. In addition, primary health care could be a suitable arena for preventing sick leave due to work-related stress.

Hultén et al. 2022.

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

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Keywords: Organisational climate; primary health care; psychosocial risk factors; sickness absence; work stress questionnaire (WSQ); work commitment; workers' health.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13269-8>

The economic burden of knee and hip osteoarthritis: absenteeism and costs in the Dutch workforce

Background: This study aimed to quantify the absenteeism costs of knee and hip osteoarthritis in the Netherlands for the Dutch workforce and specific groups of workers. **Methods:** We used a longitudinal, dynamic database from a large occupational health service in which occupational physicians register information about personal information and sick leave of workers with the diagnosis of knee- and/or hip osteoarthritis. We included all employees aged 15 to 75 years performing paid work and diagnosed with knee and/or hip osteoarthritis. Costs were calculated annually and per episode for different subgroups from an employer's perspective using the Human Capital Approach. In the Netherlands, the employer has to pay 70% of the employee's wage out of pocket for the first two years of sick leave and also for the occupational health care. In this way, employers receive information about the costs of workers on sick leave due to knee or hip osteoarthritis. This might stimulate investments in targeted prevention and work-directed care. **Results:** For the period 2015-2017, 1399 workers fulfilled the inclusion criteria. An average sick leave episode of knee osteoarthritis had a duration of 186 calendar days and was associated with €15,550 in costs. For hip osteoarthritis these data were 159 calendar days and €12,482 in costs. These costs are particularly high among male workers and workers with a higher number of weekly working hours. The average annual costs for the Dutch workforce due to sick leave for knee and hip osteoarthritis were €26.9 million and €13.8 million, respectively. Sick leave costs decreased for hip and not for knee osteoarthritis during 2015-2017. **Conclusions:** Annual sick leave costs due to knee and hip osteoarthritis are about €40 million for the Dutch workforce and approximately twice as high for knee compared to hip osteoarthritis. Average costs per sick leave episode are particularly high among male workers and workers with a higher number of weekly working hours.

Hardenberg et al. 2022.

BMC Musculoskeletal Disorders, vol. , no. .

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Keywords: Cost of illness; health expenditures; health economics; lower-limb osteoarthritis.

Evidence Level: 4B

Link: <https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/s12891-022-05306-9>

Perceived supervisor support for health affects presenteeism: A cross-sectional study

Background: We investigated the relationship between perceived supervisor support for health (PSSH) and presenteeism by adjusting for psychological distress and employee work engagement. These are the mediators of the two paths shown in the job demands-resources model. **Methods:** A cross-sectional study was conducted using a questionnaire survey among 15,158 non-managerial employees from seven companies in Japan considered to have relatively high perceived organizational support for health (POSH). PSSH was evaluated with a single question, "My supervisor supports employees to work vigorously and live a healthy life", on a four-point scale. Presenteeism was estimated using the quantity and quality method. Multilevel logistic regression analyses nested by company were conducted. **Results:** Lower PSSH was more likely to be associated with presenteeism, but after adjusting for psychological distress evaluated by K6 and for work engagement, the relationship between PSSH and presenteeism weakened. **Conclusion:** Our results suggested that lower PSSH is linked to presenteeism through both psychological states because of its role as a resource, and other independent factors, even with relatively high POSH. Increased PSSH could act as a measure against presenteeism in the workplace. To achieve this, it is important to create an environment where supervisors can easily encourage employees to improve their health.

Mori et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 18.

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Keywords: Health and productivity management; health promotion program; job demands-resources model; leadership; perceived supervisor support for health; presenteeism; psychological state.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/7/4340>

Effects of dialogue meetings on sickness absence—evidence from a large field experiment

Background: Sickness absence entails large individual and societal costs. Dialogue Meetings (DMs) where the absentee, the employer, and the physician discuss arrangements for full or partial work resumption have been in place in Norway since 2007. **Methods:** In collaboration with the Labour and Welfare Administration, we conducted a large-scale, pre-registered, randomized field experiment to evaluate aspects of the Norwegian DMs policy. **Results:** We do not find statistically significant effects of summoning to a meeting and we can reject even small threat (notification) effects of sending out letters. We also conduct an extensive search for heterogeneous treatment effects but find no evidence of these.

Alpino et al. 2022.

Journal of Health Economics, vol. 83.

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Keywords: Employment; field experiment; RCT; sickness absence.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0167629622000352?via%3Dihub>

Impact of COVID-19 vaccine-associated side effects on health care worker absenteeism and future booster vaccination

Background: Short-term side effects related to mRNA vaccines against SARS-CoV-2 are frequent and bothersome, with the potential to disrupt work duties and impact future vaccine decision-making.

Objective: To identify factors more likely to lead to vaccine-associated work disruption, employee absenteeism, and future vaccine reluctance among healthcare workers (HCWs). **Hypothesis:** Side effects related to COVID vaccination: 1- frequently disrupt HCW duties, 2- result in a significant proportion of HCW absenteeism, 3- contribute to uncertainty about future booster vaccination, 4- vary based on certain demographic, socioeconomic, occupational, and vaccine-related factors. **Methods:** Using an anonymous, voluntary electronic survey, we obtained responses from a large, heterogeneous sample of COVID-19-vaccinated HCWs in two healthcare systems in Southern California. Descriptive statistics and regression models were utilized to evaluate the research questions. **Results:** Among 2,103 vaccinated HCWs, 579 (27.5%) reported that vaccine-related symptoms disrupted their professional responsibilities, and 380 (18.1%) missed work as a result. Independent predictors for absenteeism included experiencing generalized and work-disruptive symptoms, and receiving the Moderna vaccine [OR = 1.77 (95% CI = 1.33 - 2.36), $p <$

0.001]. Physicians were less likely to miss work due to side effects (6.7% vs 21.2% for all other HCWs, $p < 0.001$). Independent predictors of reluctance toward future booster vaccination included lower education level, younger age, having received the Moderna vaccine, and missing work due to vaccine-related symptoms. **Conclusion:** Symptoms related to mRNA vaccinations against SARS-CoV-2 may frequently disrupt work duties, lead to absenteeism, and impact future vaccine decision-making. This may be more common in Moderna recipients and less likely among physicians. Accordingly, health employers should schedule future booster vaccination cycles to minimize loss of work productivity.

Chrissian et al. 2022.

Vaccine, vol. 18.

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Keywords: Absenteeism; booster; covid-19; healthcare worker; hesitancy; side-effects; vaccine.

Evidence Level: 5B

Link: [https://linkinghub.elsevier.com/retrieve/pii/S0264-410X\(22\)00474-1](https://linkinghub.elsevier.com/retrieve/pii/S0264-410X(22)00474-1)

Working hours

This month explores the relationship between working hours and health outcomes, including sleep disturbance.

How the reduction of working hours could influence health outcomes: A systematic review of published studies

Background: The health effects of work-time arrangements have been largely studied for long working hours, whereas a lack of knowledge remains regarding the potential health impact of reduced work-time interventions. Therefore, we conducted this review in order to assess the relationships between work-time reduction and health outcomes. **Design:** Systematic review of published studies. Medline, PsycINFO, Embase and Web of Science databases were searched from January 2000 up to November 2019.

Outcomes: The primary outcome was the impact of reduced working time with retained salary on health effects, interventional and observational studies providing a quantitative analysis of any health-related outcome were included. Studies with qualitative research methods were excluded. **Results:** A total of 3876 published articles were identified and 7 studies were selected for the final analysis, all with a longitudinal interventional design. The sample size ranged from 63 participants to 580 workers, mostly from healthcare settings. Two studies assessed a work-time reduction to 6 hours per day; two studies evaluated a weekly work-time reduction of 25%; two studies evaluated simultaneously a reduced weekly work-time reduction proportionally to the amount of time worked and a 2.5 hours of physical activity programme per week instead of work time; one study assessed a reduced weekly work-time reduction from 39 to 30 hours per week. A positive relationship between reduced working hours and working life quality, sleep and stress was observed. It is unclear whether work time reduction determined an improvement in general health outcomes, such as self-perceived health and well-being. **Conclusions:** These findings suggest that the reduction of working hours with retained salary could be an effective workplace intervention for the improvement of employees' well-being, especially regarding stress and sleep. Further studies in different contexts are needed to better evaluate the impact of work-time reduction on other health outcomes.

Voglino et al. 2022.

BMJ Open, vol. 12, no. 4.

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

Evidence Level: 1A

Link: <https://bmjopen.bmj.com/content/12/4/e051131.long>

Working hours, sleep disturbance and self-assessed health in men and women: A multilevel analysis of 30 countries in Europe

Background : This study examined the gender and cross-country differences in the relationship between working hours and self-assessed health among working men and women in Europe, and further explored

the moderating role of sleep disturbance in the relationship. **Methods:** We used cross-sectional data from the 6th European Working Condition Survey on 14,603 men and 15,486 women across 30 countries in Europe. A multivariate logistic regression was applied to evaluate the relationship between working hours, sleep disturbance, and self-assessed health. In addition, we employed a two-stage multilevel logistic regression to assess the cross-country variations in the relationship between working hours and self-assessed health. **Results:** The study showed a slightly U-shaped relationship between working hours and less-than-good self-assessed health among working adults in Europe (<31 h: aOR = 1.11; 95% CI: 1.00-1.25, 41-50 h: aOR = 0.98; 95% CI: 0.84-1.15, and 50+ h: aOR = 1.31; 95% CI: 1.07-1.59). However, working men had higher odds of reporting less-than-good self-assessed health as compared to women when they devote longer hours to paid work. The results further showed that there are cross-country variations in the association between working hours and less-than-good self-assessed health for both men and women, and that men had slightly lower variations as compared to women. Contrary to expectation, sleep disturbance did not moderate the relationship between working hours and less-than-good self-assessed health for both men and women in Europe. **Conclusions:** Although there are gender differences and cross-country variations in the association between working hours and less-than-good self-assessed health, sleep disturbance did not moderate the associations. These findings underscore the importance for strict work time regulation and generous work-family policies that may promote good working conditions and health.

Mensah et al. 2022.

Frontiers in Public Health, vol. 10.

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Keywords: Europe; gender; moderating role; self-assessed health; sleep disturbance; welfare policies; work hours; working adults.

Evidence Level: 4B

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2022.818359/full>

Building Employer Capability

Wellness Programs

This month sees the exploration of workplace interventions to improve health of staff in hospitals, for work integration and quality of life of patients in an acute psychiatric day care unit and building capacity for employee engagement in workplace wellness initiatives.

Describing workplace interventions aimed to improve health of staff in hospital settings – A systematic review

Background: A large proportion of staff working in hospital settings are overweight or obese, have poor dietary habits and low physical activity levels. The workplace is a priority setting for health promotion. This systematic review will describe dietary and physical activity workplace interventions that have aimed to improve the health of staff in hospital settings; and the barriers and enablers of implementing these interventions. **Methods:** A systematic search retrieved 551 studies from 2004 to 2020 using the following databases CINAHL Complete, MEDLINE Complete, Academic Search Complete, Global Health, Health Source Nursing/Academic Edition and PsycINFO. Studies were included if they: (1) took place in a hospital setting; (2) employed a physical activity or dietary intervention to improve the well-being of staff; (3) the intervention duration was 12 weeks or over; (4) used a control group. The Integrated quality Criteria for the Review of Multiple Study designs (ICROMS) and National Institute of Health's National Heart Lung and Blood Institute Quality Assessment Tools for Observational Cohort and Cross-Sectional Studies tools were used to assess quality of included studies. A narrative review was conducted. **Results:** Quality analysis identified six studies of high quality, nine moderate quality, and three low quality. Of these 18 studies, 15 reported at least one positive health outcome. The evidence revealed that multi-component strategies, financial incentives and motivational strategies were the most effective approaches to improve health behaviours of hospital staff. **Conclusion:** Hospital-based dietary and physical activity workplace interventions show promise as an effective strategy for improving health behaviours of hospital staff.

Methodological limitations highlight the need for more research from high-quality, randomised control trials, to gain further insight into the benefits of workplace interventions in hospital settings.

Worley et al. 2022.

BMC Health Services Research, vol. 22, no. 1.

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Keywords: Health behaviours; hospital; staff; systematic review; workplace intervention.

Evidence Level: 1A

Link: <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-021-07418-9>

Fit for Work and Life-an eight-week program for improvement of functionality and quality of life : A two-stage study

Background: The current two-stage study focused on work integration and quality of life of patients in an acute psychiatric day care unit. There is evidence that a longer absence from work due to illness negatively affects job retention, life satisfaction and clinical prognosis. Furthermore, there are individual supportive methods that proved to be effective in work integration. We therefore developed a specific group program Fit for Work and Life (FWL) for patients in an acute psychiatric day care unit focusing on work integration in the first labor market (in contrast to work in institutions for people with disabilities/second labor market).

Methods: Between 2018 and 2020, 62 patients (intervention group; IG) were enrolled in an 8-week prospective job integration program and compared to 74 patients (control group; CG) who received treatment as usual (partly retrospective survey). Patients of both groups held a job when entering treatment. Main outcome was defined as their working status 4 weeks after the end of treatment as well as self-reported life satisfaction. **Results:** At the end of treatment (i.e. the week prior to discharge), the IG participants reported higher overall life satisfaction as well as higher health-, self- and living condition-related satisfaction than controls. Functional and clinical improvement during treatment was linked to subsequently returning to work. Functional improvement was further linked to higher life satisfaction. Mediation analysis revealed an indirect path from functional improvement on life satisfaction via working status, i.e. the higher functional improvement during treatment, the higher the chance of successfully returning to work, which in turn increased life satisfaction. **Conclusion:** Our findings suggest that programs such as FWL are useful interventions for employed patients to improve reintegration into work and life and to help to increase life satisfaction.

Pausch et al. 2022.

Neuropsychiatrie, vol. 15, no. 1-12.

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Keywords: First labor market; healthcare research; psychiatric patients; quality of life; work integration.

Evidence Level: 3B

Link: <https://link.springer.com/article/10.1007/s40211-022-00415-2>

Exploring corporate stakeholders' perspectives on building capacity for employee engagement in workplace wellness initiatives

Background: Engaging employees with chronic conditions as partners in designing, implementing, and evaluating workplace wellness activities is a promising approach for optimizing the impact of workplace health promotion programs. Yet, there is a need for information on how employees are engaged in this process. **Methods:** We conducted a process evaluation of activities of the Patient-Centered Outcomes Research for Employees (PCORE) project formed around building capacity for employee engagement in wellness initiatives. Individual interviews were conducted with the 11 project stakeholders to explore perspectives of the project's participatory process and activities. **Results:** Thematic categories emerging in the analysis were (1) Commitment and support, (2) Understanding purpose and roles, (3) Role of employees in wellness programming, and (4) Communication during meetings. This process evaluation provides insights from a model of stakeholder engagement in the corporate setting. **Conclusion:** Creating an environment that supports meaningfully engaging employees as partners in co-creating workplace wellness initiatives requires effectively addressing the unique aspects of the U.S. corporate culture such as the emphasis on productivity and the prevalent traditional top-down organizational structures.

Keller et al. 2022.

Journal of Patient Experience, vol. 5.

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

Keywords: Employee engagement; population health; research capacity building; workplace wellness.

Evidence Level: 5B

Link: <https://journals.sagepub.com/doi/full/10.1177/23743735221092619>

Organisational Issues

This month the organisational issues influencing organizational commitment and job satisfaction of shipyard blue-collar workers is explored.

Which personal and organizational factors influence the organizational commitment and job satisfaction of shipyard blue-collar workers?

Background: The purpose of this research was to analyze which personal and organizational factors are related to organizational commitment and job satisfaction of shipyard workers who work in different auxiliary shipyard military companies in the north of Spain. **Methods:** In total, 567 shipyard workers participated in this cross-sectional survey study. The ages were between 19 and 64 (M = 39.36, SD = 10.01), males 82.52%, females 17.48%. We used a survey that included questions about personal and organizational factors such as physical environment, occupational risks, and psychosocial risks, in addition to the job commitment and job satisfaction scales. **Results:** The results of this study show that job commitment is significantly related to a higher age, lower education, and environmental risk (low vs. high). Furthermore, job satisfaction (high vs. low) and organizational commitment (high vs. low) is related with environmental risk (low vs. high). Job commitment is also higher in workers with a low educational level and older workers. Job satisfaction is lower in workers with a high educational level. **Conclusions:** This study shows that different personal and environmental factors influence the shipyard workers' organizational commitment and job satisfaction.

Reig-Botella et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 18.

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Keywords: Blue-collar workers; job commitment; job satisfaction; personal and organizational factors; shipyard.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/8/4849>

Job Design

This month explores the moderating effects of job demand and work schedules on overweight and obesity amongst workers, and the effect of working from home following the covid pandemic.

Modification effect of job demand and contingent work schedule on overweight and obesity among civil servants in Taiwan

Objective: Evidence indicated that shift work is a contributing factor to risk of obesity and leads to cardiovascular diseases (CVDs), but few researches have examined the moderating effects of job demand and contingent work schedule on overweight and obesity. Thus, we assessed the modification effect of contingent work schedules and job demand on overweight and obesity among Taiwan's civil servants.

Methods: Multistage stratified random cluster sampling was used based on a proportional probabilistic sampling (PPS) in a national survey for civil servants. A total of 20,046 participants from 647 registered governmental institutions were enrolled and anonymously and voluntarily filled out web-based questionnaires. **Results:** Compared to fixed work schedule, odd ratios (ORs) of obesity and overweight were 1.63 and 1.78 times in contingent work schedule, respectively. In addition, the modification effects of

contingent work schedule and high job demand on overweight and obesity with Rothman's synergy index were 2.43 and 2.56, respectively. Using a hierarchical regression model adjusted for covariates, both high job demand and contingent work schedule were interactively associated with overweight and obesity compared to low job demand and fixed work schedule. **Conclusion:** Since precarious schedules affect employee's obesity through work-related stress and unhealthy behaviors, further research is needed to determine whether interventions aimed at modification of work schedule may be useful in combating obesity.

Tseng et al. 2022.

Diabetes, Metabolic Syndrome and Obesity, vol. 5.

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(<https://creativecommons.org/licenses/by-nc/3.0/>)

Keywords: Civil servants; contingent work schedule; overweight/obesity; workload.

Evidence Level: 4B

Link: <https://www.dovepress.com/modification-effect-of-job-demand-and-contingent-work-schedule-on-over-peer-reviewed-fulltext-article-DMSO>

Work from home in the post-COVID world

Background: The working standard of shared office spaces has evolved in recent years. Due to the ongoing COVID-19 pandemic, many companies have instituted work from home (WFH) policies in accordance with public health guidelines in order to increase social distancing and decrease the spread of COVID-19. As the pandemic and WFH-related policies have continued for more than a year, there has been a rise in people becoming accustomed to the remote environments; however, others are more enthusiastic about returning to in-person work environments, reflecting the desire to restore pre-pandemic environments. As working from home is related to transportation issues such as changing commuting patterns and decreased congestion, motorized trips, and emission, there is a need to explore the extent of public attitudes on this important issue. **Methods:** This study used unique open-source survey data that provides substantial information on this topic. Using an advanced categorical data analysis method known as cluster correspondence analysis, this study identified several key findings. **Results:** Not having prior WFH experiences, being eager to interact with colleagues, difficulties with adapting to virtual meeting technologies, and challenges with self-discipline while WFH were strongly associated with individuals who refused to continuously WFH at all after the pandemic. Individuals holding a strong view against the seriousness of the COVID-19 pandemic were also largely associated with never choosing WFH during and after the pandemic. For individuals with some prior WFH experiences, the transition to WFH every day in response to the outbreak was much easier, compared to those without prior experiences. Moreover, being forced to WFH during the COVID-19 pandemic positively influences the choice of WFH after the pandemic. **Findings:** The findings of this study will be beneficial to help policymakers and sustainable city planners understand public opinions about WFH.

Kong et al. 2022.

Case Studies on Transport Policy, vol. 6.

User License: *Elsevier Connect COVID-19 resource centre*

Keywords: COVID-19; pandemic; work from home.

Evidence Level: 5A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8985448/>

Shift Work

This month we explore the effect of shift work on covid infections, psychiatric health, cardiovascular disease risk and quality of life. One study also explores the effect of changing from an 8- to a 12-hour shift system on sleep and recovery.

Sleep, sleepiness and need for recovery of industrial employees after a change from an 8- to a 12-hour shift system

Background: Employees often prefer 12-hour work shifts but they can increase sleepiness and injury risk. We assessed whether sleep, sleepiness, satisfaction and need for recovery changed after changing from an 8-hour to a 12-hour shift system. **Methods:** The participants were 178 employees of the paper, pulp and chemical industries. Using a quasi-experimental controlled intervention design, 83 employees, who changed from an 8-hour shift schedule to a 12-hour shift schedule were compared to those who remained in the 8-hour shift schedule (n=95). Participants filled in a survey on sleep, sleepiness, satisfaction and need for recovery at baseline and 9-12 months after the shift schedule change. We used generalized estimation equation models adjusted for age, sex, shift work experience in years and baseline shift system. **Results:** Sleep length was longer in the 12-hour shift schedule before the first morning shift and between morning shifts. Sleepiness during morning shifts was less frequent and satisfaction with the shift system was more prevalent in the 12-hour shift schedule. Also, perceived negative associations of the current shift system with work-life balance were less common in the 12-hour shift schedule. The differences found between the shift systems were minor and the results did not indicate significant disadvantages of the 12-hour fast forward-rotating shift system.

Puttonen et al. 2022.

Industrial Health, vol. 60, no. 2.

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Keywords: Controlled study; extended work shift; shift scheduling; shift work; sleep; sleepiness; work-life balance.

Evidence Level: 3A

Link: https://www.jstage.jst.go.jp/article/jndhealth/60/2/60_2021-0052/article

Work hours as a risk factor for SARS-CoV-2 infections: cardiometabolic and sleep characteristics in rotating shift workers

Background: This study aims to describe the health characteristics of rotating shift mining workers that may be related to a worse course scenario for COVID-19, according to literature data. **Methods:** Is a cross-sectional from three studies with 1478 shift workers. Social, demographic, clinical, and biochemical variables were analysed. Risk factors for COVID-19 analysed: hyperglycaemia, altered blood pressure, dyslipidaemia, hypovitaminosis D, obesity, presence of pre-existing cardiovascular diseases, and smokers.

Results: Evaluating the grouped risk factors for an unfavourable evolution of COVID-19 most workers (91.0%) presented at least one risk factor. **Discussion:** With coronavirus in pandemic circulation, we noticed that mineworkers are in a vulnerable position. Their exposure to occupational risk factors, to the shift system, which directly affects sleep and negatively influences immunity, added to the conditions of favorable transmissibility by the flow of people from the mines leads us to believe in their greater susceptibility to acquiring the most serious forms of the disease.

Nascimento et al. 2022.

Sleep Science, vol. 15.

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

Keywords: Betacoronavirus; circadian rhythm; coronavirus infections; mining; sleep deprivation.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8906381/>

Night-shift work and psychiatric treatment. A follow-up study among employees in Denmark

Background: We aimed to test the hypotheses that night-shift work is associated with an increased incidence of (i) redeemed prescriptions for psychotropic medicine and (ii) psychiatric hospital treatment due to mood, anxiety or stress-related disease. Moreover, we aimed to assess whether (iii) the effect of night-shift work on the rates of antidepressants differs from the effects on the rates of anxiolytics and (iv) the association between night-shift work and psychotropic medicine is affected by long working hours.

Methods: Full-time employees who participated in the Danish Labor Force Survey sometime in the period 2000-2013 (N=131 321) were followed for up to five years in national registers for redeemed prescriptions and psychiatric hospital treatment. The analyses were controlled for sex, age, weekly working hours, calendar time of the interview and socioeconomic status. **Results:** We detected 15 826 cases of

psychotropic drug use in 521 976 person-years at risk and 1480 cases of hospitalization in 636 673 person-years at risk. The rate ratio (RR) for psychotropic drugs was estimated to be 1.09 [99% confidence interval (CI) 1.02-1.16] for night-shift versus no night-shift work. The corresponding RR for psychiatric hospital treatment was 1.11 (95% CI 0.95-1.29). The odds of redeeming a prescription for antidepressants rather than anxiolytics was independent of night-shift work: 1.09 (95% CI 0.96-1.24), and we found no interaction effect between night-shift work and working hours (P=0.26). **Conclusion:** As it appears in the general working population in Denmark, night-shift work is not an important predictor of mental ill health.

Albertsen et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 48, no. 3.

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

Keywords: Night shift; psychiatric; prescription medication; psychotropic medicine; Denmark

Evidence Level: 4B

Link: <https://www.sjweh.fi/article/4008>

Influence of shift work on cardiovascular disease risk in Southern African long-distance truck drivers: A cross-sectional study

Background: Cardiovascular disease (CVD) is a major problem globally. Truck drivers have an increased risk of CVD due to a sedentary lifestyle, irregular working hours and behavioural choices. We aimed to get insight into the contribution of night shift work to CVD risk in long-distance truck drivers in South Africa.

Design: A cross-sectional study. **Setting:** Enrolment took place at three South African truck stop locations in two provinces; Bloemfontein (Free State), Pomona Road (Gauteng) and Soweto (Gauteng).

Participants: 607 males aged ≥ 18 years with full-time employment as a long-distance truck driver were included. The criteria for inclusion were willingness and being able to provide informed consent and to complete the study procedures. **Primary and secondary outcome measures:** Information was collected on sociodemographics, occupational and health characteristics. Physical measurements, an ECG and carotid intima-media thickness (CIMT) measurements were taken. A night shift was defined as working at least 3 hours between 22:00 and 6:00 hours once a week. CVD risk was defined with the Framingham Risk Score (FRS), the Atherosclerotic Cardiovascular Disease (ASCVD) risk algorithm, left ventricular hypertrophy (LVH) and CIMT. **Results:** In total, 607 truck drivers were included of which 305 (50.2%) worked in day shifts only and 302 (49.8%) worked day and night shifts. There was a high prevalence of CVD risk factors in both groups as 33% were hypertensive, 28% obese and 37% had abnormal lipid levels. Working day and night shifts compared with working only day shifts did not result in differences in FRS, ASCVD risk or LVH. No difference was found in CIMT measurements, except for the maximum bulb thickness which was higher in day shift workers. **Conclusions:** CVD risk factors are considerably present in male truck drivers in South Africa. CVD risk does not differ between dayshift and day-night shift workers in this cross-sectional analysis.

Draaijer et al. 2022.

BMJ Open, vol. 12, no. 4.

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Keywords: Atherosclerotic cardiovascular disease risk; carotid intima-media thickness; framingham risk score; left ventricular hypertrophy; South-Africa; cardiovascular risk factors.

Evidence Level: 4B

Link: <https://bmjopen.bmj.com/content/12/4/e050645.long>

Social and professional recognition are key determinants of quality of life at work among night-shift healthcare workers in Paris public hospitals (AP-HP ALADDIN COVID-19 survey)

Background: Documenting the perceptions and experiences of frontline healthcare workers during a sanitary crisis is key to reinforce healthcare systems. We identify the determinants of quality of working life (QWL) among night-shift healthcare workers (NSHW) in Paris public hospitals shortly after the first-wave of the COVID-19 pandemic. **Methods:** The ALADDIN cross-sectional online survey (15 June to 15 September 2020) collected QWL, socio-economic, behavioral, and work-related information among 1,387 NSHW in the 39 hospitals of the Assistance Publique-Hôpitaux de Paris (AP-HP). Data were weighted (margin calibration) to be representative of the entire population of 12,000 AP-HP hospitals' NSHW regarding sex, age, and professional category. Linear regression was used to identify correlates of QWL (WRQoL scale).

Results: New night position during the COVID pandemic, difficulties in getting screened for COVID, and considering protective measures inadequate were associated with poorer QWL, after adjustment for socio-economic characteristics, professional category, perceived health, physical activity, and history of harassment at work. Under-estimation of night-shift work by day-shift colleagues, reporting night work as a source of tension with friends, or feeling more irritable since working at night also impaired QWL. By contrast, satisfaction regarding COVID information received from the employer, and feeling valued by the general population during the pandemic improved QWL. **Conclusions:** Insufficient access to screening, information, and protective measures impaired QWL of NSHW after the first wave of COVID-19 in Paris public hospitals. Social and professional recognition of night-shift work were the key determinants of QWL in this population.

Duracinsky et al. 2022.

PLoS One, vol. 17, no. 4.

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Keywords: Night shift; quality of life; hospitals; COVID-19; Paris.

Evidence Level: 4B

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0265724>

Work Ability

This month we explore the relationship between work ability and factors such as working from home, long-duration activity-limiting neck/back pain and newly diagnosed atrial fibrillation.

Work-from-home productivity during the COVID-19 pandemic: Evidence from Japan

Background/Methods: This study examines the productivity of working from home (WFH) practices during the COVID-19 pandemic. The results reveal that the mean WFH productivity relative to working at the usual workplace was about 60%-70%, and it was lower for employees and firms that started WFH practice only after the spread of the COVID-19 pandemic. However, there was a large dispersion of WFH productivity, both by individual and firm characteristics. Highly educated and high-wage employees tended to exhibit a small reduction in WFH productivity. The results obtained from the employee and employer surveys were generally consistent with each other.

Morikawa 2022.

Economics Enquiry, vol. 60, no. 2.

User License: *PMC Open Access Subset*

Keywords: COVID-19; productivity; social distancing; working from home.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9011721/>

Influence of work ability and smoking on the prognosis of long-duration activity-limiting neck/back pain: a cohort study of a Swedish working population

Background: Long-duration activity-limiting neck/back pain is common, but the knowledge of what work and lifestyle factors that influence the prognosis is sparse. The objective was therefore to evaluate if two factors, good self-perceived work ability and no daily smoking, are associated with a favourable prognosis of long-duration activity-limiting neck/back pain in a working population, and if these exposures have a synergistic prognostic effect. **Design:** A prospective cohort study based on three subsamples from the Stockholm Public Health Cohort. **Settings:** A working population in Stockholm County, Sweden.

Participants: Individuals, 18-61 years old, reporting long-duration activity-limiting neck/back pain the previous 6 months at baseline in 2010 (n=5177). **Measures:** The exposures were: self-perceived work ability (categorised into good, moderate and poor) and daily smoking (no/yes). The outcome in 2014 was 'absence of long-duration activity-limiting neck/back pain' the previous 6 months representing a favourable prognosis of reported problems at baseline in 2010. Risk ratios (RRs) and risk differences (RDs) with 95% CI was estimated by general linear regressions, and the synergistic effect was estimated by the synergy index (SI) with 95% CI. **Results:** Participants with moderate or good work ability, respectively, had an adjusted RR

for a favourable prognosis of 1.37 (95% CI 1.11 to 1.69), and 1.80 (1.49 to 2.17) in comparison with participants with poor work ability. The corresponding adjusted RD were 0.07 (0.02 to 0.11) and 0.17 (0.12 to 0.22). Participants not smoking on daily basis had an adjusted RR of 1.21 (1.02 to 1.42), and an adjusted RD of 0.05 (0.01 to 0.10) for a favourable outcome compared with daily smokers. The adjusted SI was 0.92 (0.60 to 1.43). **Conclusion:** For participants with long-duration activity-limiting neck/back pain, moderate or good self-perceived work ability and not being a daily smoker were associated with a favourable prognosis but having both exposures seemed to have no synergistic prognostic effect.

Bohman et al. 2022.

BMJ Open, vol. 12, no. 4.

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Keywords: Back pain; epidemiology; musculoskeletal disorders; public health; spine.

Evidence Level: 4B

Link: <https://bmjopen.bmj.com/content/12/4/e054512.long>

Association between newly diagnosed atrial fibrillation and work disability (from a nationwide Danish cohort study)

Background: It is previously shown that cardiovascular conditions have a negative effect on the ability to work. However, it is unknown if incident atrial fibrillation (AF) influences the ability to work. **Methods:** We examined the association between AF and the risk of work disability and the influence of socioeconomic factors. All Danish residents with a hospital diagnosis of AF and aged ≥ 30 and ≤ 63 years in the period January 1, 2000, to September 31, 2014, were included and matched 1:10 with an AF-free gender and age-matched random person from the general population. Permanent social security benefit was used as a marker of work disability. Risk difference (RD) and 95% confidence interval (95% CI) of work disability were calculated over 15 months. The analyses were furthermore stratified in low, medium, and high levels of socioeconomic factors. **Results:** In total, 28,059 patients with AF and 312,667 matched reference persons were included. The risk of receiving permanent social security benefits within 15 months was 4.5% (4.3% to 4.8%) for the AF cohort and 1.3% (95% CI 1.3% to 1.4%) for the matched reference cohort. Adjusted RD (95% CI) was 2.3% (2.0% to 2.5%). Stratified on income, RDs were higher in low-income groups (adjusted RD 3.7% [95% CI 3.1% to 4.3%]) versus high-income groups (RD 1.3% [1.0% to 1.5%]). **In conclusion,** the risk of work disability within 15 months after incident AF was more than 3 times as high in patients with AF compared with the general population, especially when comparing individuals in lower socioeconomic strata.

Lunde et al. 2022.

The American Journal of Cardiology, vol. 169.

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Keywords: Atrial fibrillation; disability; cardiovascular; work.

Evidence Level: 4B

Link: [https://linkinghub.elsevier.com/retrieve/pii/S0002-9149\(21\)01274-1](https://linkinghub.elsevier.com/retrieve/pii/S0002-9149(21)01274-1)

Working Hours

This month explores the effect of long working hours on health problems.

Health problems associated with single, multiple, and the frequency of months of objectively measured long working hours: A cohort study by the National Institute of Occupational Safety and Health, Japan

Background: We aimed to examine the prospective associations of monthly working hours measured in a month, the 6-month averaged hours, and the frequency of long working hours (≥ 205 h/month) during the past 6 months with health indicators. **Methods:** This study included 6,806 Japanese company workers (response rate = 86.6%). Data on the workers' monthly attendance during the second half of fiscal year 2016 and annual health checkups in fiscal years 2016 and 2017 were collected. We evaluated the association of the above three types of monthly working hours with subsequent health checkup data in fiscal year 2017. We adjusted for the corresponding data in fiscal year 2016. **Results:** Multivariate logistic

regression analyses revealed significant associations between monthly working hours and workers' systolic and diastolic blood pressure as well as aspartate aminotransferase, alanine aminotransferase, low-density lipoprotein cholesterol (LDL), and triglyceride levels. However, the associations were not consistent between months. The average monthly working hours were significantly associated with higher LDL levels for the 220-240 h/mo group (OR: 1.49, 95%CI: 1.07-2.08) and lower triglyceride levels for the < 140 h/mo group (OR: 0.15, 95%CI: 0.03-0.77), compared to the 140-180 h/mo group. The frequency of long working hours was significantly associated with higher LDL levels. **Conclusions:** Working hours over several months produced various associations with health indicators compared to those measured in a single month. Our present data suggest that the effects of average or frequency of long working hours during the past 6 months are likely to appear in LDL levels.

Ochiai et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 3.

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Keywords: Exposure assessment; health checkup; low-density lipoprotein cholesterol; overtime.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007/s00420-021-01768-x>

Adapting to the Future of Work

Technology

In this month's Technology section we explore workers attitudes towards robots at work and digitalization at work, and the effects of an app-based mindfulness and music intervention on employees' stress and cognition.

Affective attitudes toward robots at work: A population-wide four-wave survey study

Background: Robotization of work is progressing fast globally, and the process has accelerated during the COVID-19 pandemic. **Methods:** Utilizing integrated threat theory as a theoretical framework, this study investigated affective attitudes toward introducing robots at work using a four timepoint data (n = 830) from a Finnish working population longitudinal study. We used hybrid multilevel linear regression modelling to study within and between participant effects over time. **Results:** Participants were more positive toward introducing robots at work during the COVID-19 pandemic than before it. Increased cynicism toward individuals' own work, robot-use self-efficacy, and prior user experiences with robots predicted positivity toward introducing robots at work over time. **Conclusion:** Workers with higher perceived professional efficacy were less and those with higher perceived technology-use productivity, robot-use self-efficacy, and prior user experiences with robots were more positive toward introducing robots at work. In addition, the affective attitudes of men, introverts, critical personalities, workers in science and technology fields, and high-income earners were more positive. Robotization of work life is influenced by workers' psychological well-being factors and perceived as a welcomed change in the social distancing reality of the pandemic.

Savela et al. 2022.

International Journal of Social Robots, vol. 16, no. 1-17.

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Keywords: Attitude; longitudinal; robot; well-being; work.

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9012866/>

Mindfulness and music interventions in the workplace: assessment of sustained attention and working memory using a crowdsourcing approach

Background: Occupational stress has huge financial as well as human costs. Application of crowdsourcing might be a way to strengthen the investigation of occupational mental health. Therefore, the aim of the study was to assess Danish employees' stress and cognition by relying on a crowdsourcing approach, as

well as investigating the effect of a 30-day mindfulness and music intervention. **Methods:** We translated well-validated neuropsychological laboratory- and task-based paradigms into an app-based platform using cognitive games measuring sustained attention and working memory and measuring stress via. Cohen's Perceived Stress Scale. A total of 623 healthy volunteers from Danish companies participated in the study and were randomized into three groups, which consisted of a 30-day intervention of either mindfulness or music, or a non-intervention control group. **Results:** Participants in the mindfulness group showed a significant improvement in the coefficient of sustained attention, working memory capacity and perceived stress ($p < .001$). The music group showed a 38% decrease of self-perceived stress. The control group showed no difference from pre to post in the survey or cognitive outcome measures. Furthermore, there was a significant correlation between usage of the mindfulness and music app and elevated score on both the cognitive games and the perceived stress scale. **Conclusion:** The study supports the nascent field of crowdsourcing by being able to replicate data collected in previous well-controlled laboratory studies from a range of experimental cognitive tasks, making it an effective alternative. It also supports mindfulness as an effective intervention in improving mental health in the workplace.

Axelsen et al. 2022.

BMC Psychology, vol. 10, no. 1.

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Keywords: App-based cognitive games; crowdsourcing; mindfulness; music; n-back; stress; sustained attention.

Evidence Level: 3B

Link: <https://bmcpyschology.biomedcentral.com/articles/10.1186/s40359-022-00810-y>

Decomposing the effects of digitalization on workers' job satisfaction

This paper provides novel results on the relative importance of multiple channels through which digitalization affects job satisfaction. Using part-time students and graduates of professional education and training colleges in Switzerland as a case study, we investigate the relative strength of ten different channels. We find that the association between digitalization and job satisfaction is positive on average. This relationship is mainly due to the increase in productivity and more interesting work. Heterogeneity analyses on subsets of workers suggest that the effect through increasing productivity is more beneficial for women, for older workers, for workers without an executive position, and for workers who did not study in technology-related fields. The effect through the interestingness of work is larger for males and for older workers. Our results further suggest that among the channels that decrease job satisfaction, increase of time pressure and worsening of work-life balance are much more important than the threat of losing one's job. Both channels are more relevant for men, for older workers, and for workers whose field of study is technology-related.

Bolli et al. 2022.

International Review of Economics, vol. 17, no. 1-38.

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Keywords: Digitalization; job satisfaction; professional education and training.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9013425/>

Guiding and Supporting Mental Health and Wellbeing

Mental Health

This month we explore the effects of covid related working from home requirements, vaccinations and other workplace measures against COVID-19 on workers mental health. Studies also explore mental health issues amongst police officers, public safety personnel, tram and long-haul truck drivers and manufacturing workers

Women's experience of depressive symptoms while working from home during the COVID-19 pandemic: Evidence from an international web survey

Background: The COVID-19 pandemic led to significant changes in workplace practices as social distancing requirements meant that people were asked to work from home where possible to avoid unnecessary contact. Concerns have been raised about the effects of the pandemic on mental health and, in particular, the effects of social distancing on employed women's mental health. **Methods:** In this study, we explore the experiences of working women during the initial stages of the COVID-19 pandemic and explore the factors that may be associated with women experiencing the symptoms of depression. Findings from a cross-sectional survey of European working women (across five countries: France, Italy, Poland, Sweden, and the UK) conducted between March and July 2020 are reported. The data are analyzed using linear regression and mediation analysis. **Results:** For women, working from home was associated with higher prevalence of the symptoms of depression compared to traveling to a workplace. The study also considers the mechanisms that may explain a relationship between working from home and depressive symptoms. **Conclusion:** Maintaining contact with people face-to-face and participating in exercise were both significant protective factors against experiencing symptoms of depression during a period of social distancing.

Burn et al. 2022.

Frontiers in Sociology, vol 8.

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Keywords: COVID-19; depression; home-working; mental health; women.

Evidence Level: 4B

Link: <https://www.frontiersin.org/articles/10.3389/fsoc.2022.763088/full>

COVID-19 vaccination did not improve employee mental health: A prospective study in an early phase of vaccination in Japan

Background: This study aimed to examine the effectiveness of vaccination to improve mental health among employees in Japan based on a prospective study. **Methods:** The data were retrieved from the Employee Cohort Study conducted during the COVID-19 pandemic in Japan (E-COCO-J) at T1 (4-10 February 2021) and T2 (22-29 June 2021). Psychological distress was measured by using an 18-item scale of the Brief Job Stress Questionnaire (BJSQ). The analytic sample was limited to individuals employed at both T1 and T2 without missing covariates. Vaccination status was measured at T2. Statistical analysis was conducted to test the differential change in the psychological distress at T1 and T2 with the time × group interactions by using repeated ANOVA, adjusting for the covariates (gender, age, marital status, education, chronic disease, company size, industry, and occupation). **Results:** Of the total sample (N = 948), 105 (11.1%) were vaccinated at least once at T2. The crude mean scores of psychological distress at T1 and T2 were 41.8 and 42.0 for vaccinated participants and 41.2 and 41.2 for nonvaccinated participants, respectively, with no significant effect of having been vaccinated (Cohen's $d = 0.02$, $P = 0.833$). After adjusting the covariates, there was no significance ($P = 0.446$). **Conclusions:** The COVID-19 vaccination was supposed to have a limited effect on mental health among Japanese employees in an early phase of vaccination. To keep providing mental health care for employees is important even after starting the vaccination program.

Sasaki et al. 2022.

Neuropsychopharmacology Reports, vol. 12.

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Keywords: SARS-CoV-2; anxiety; depression; epidemiology; occupational health; prevention; public health; vaccine.

Evidence Level: 4B

Link: <https://onlinelibrary.wiley.com/doi/10.1002/npr2.12250>

Effects of workplace measures against COVID-19 and employees' worry about them on the onset of major depressive episodes: A 13-month prospective study of full-time employees

Background: Workplace measures against COVID-19 may prevent the onset of major depressive episode (MDE) in the working population. This 13-month prospective study aimed to investigate the association of the number of workplace measures against COVID-19 and employees' worry about the measures on the onset of MDE during COVID-19 outbreaks in Japan. **Methods:** Data were collected from employees by using online questionnaires at baseline (May 2020) and the 7th survey (June 2021). The onset of MDE during the

follow-up was retrospectively measured at the 7th survey, with a self-report scale based on the Mini-International Neuropsychiatric Interview according to the DSM-IV/DSM-5 criteria. Participants were asked to report the number of workplace measures against COVID-19 in their companies/organizations and their worry about these measures (scored 0-3). Multiple logistic regression was conducted of MDE on the number of workplace measures and worry about these, adjusting for demographic and work-related covariates and psychological distress at baseline. **Results:** Among 968 respondents employed in May 2020, 827 completed the 7th survey in June 2021 (80%). We excluded 75 respondents who reported they had an MDE in May 2020 or earlier. Worry about workplace measures was significantly associated with the onset of MDE after adjusting for the covariates (OR for 1 score increase, 1.53; 95% CI, 1.02-2.32; $p = 0.042$). No significant association was found between the number of workplace measures and the onset of MDE.

Conclusions: Worrying about workplace measures taken by company/organization may be a risk factor for the onset of an MDE among employees during the COVID-19 pandemic.

Kawakami et al. 2022.

Journal of Affective Disorders, vol. 16.

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Keywords: Follow-up study; Japan; mental disorders; non-pharmaceutical interventions on COVID-19; working population.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S0165032722003780?via%3Dihub>

Workplace reintegration facilitator training program for mental health literacy and workplace attitudes of public safety personnel: Pre-post pilot cohort study

Background: Public safety personnel (PSP) impacted by operational stress injuries can find themselves needing both time off work and support reintegrating back into the workforce. Work reintegration programs have been introduced in PSP organizations to support those who aim to return to work. One such peer-led workplace reintegration program (RP) was created in 2009 by members of the Edmonton Police Service (EPS). The primary goal of the EPSRP is to assist PSP in returning to work as soon as possible following a critical incident, illness, or injury while diminishing the potential for long-term psychological injury. The EPSRP is delivered by peers through 3 interrelated components: (1) the Reintegration Program Facilitator Training (RPFT) Program; (2) a short-term Critical Incident RP; and (3) a long-term RP. There is a dire need for research that incorporates strong study designs to determine long-term effectiveness of the program on increasing workplace reintegration, improving mental health knowledge, and creating culture change within PSP organizations. Simultaneously, the efficacy, effectiveness, and fidelity of the RPFT in providing the tools, mental health knowledge, and skills the RP peer facilitators will need for the RP must be evaluated. **Objective:** The purpose of this quasi-experimental pre-post pilot cohort study is to evaluate the effectiveness of the EPSRPFT course on influencing mental health knowledge and attitudes of RPFT attendees who will be future RP peer facilitators. **Methods:** This pre-post cohort study collected data via 2 questionnaires from RPFT participants (N=60) which included the Mental Health Knowledge Survey (MAKS) and the Open Minds Survey of Workplace Attitudes (OMSWA). Descriptive, parametric (sample t tests), and nonparametric (Wilcoxon signed rank tests) statistics were used to compare the pre- and post-RPFT results and to analyze results by gender and profession. **Results:** Statistically significant changes were observed in pre-post questionnaire scores in the domains of mental health attitudes and knowledge.

Conclusions: Although results are explorative, the RPFT may facilitate positive changes in workplace mental health attitudes and knowledge among PSP. It is hoped these findings will contribute to a broader evidence base that can inform changes to the program, practices, and policies, and inform decision-making regarding the EPSRP.

Jones et al. 2022.

JMIR Formative Research, vol. 6, no. 4.

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Keywords: First responders; mental health; public safety personnel; reintegration; return to work.

Evidence Level: 4A

Link: <https://formative.jmir.org/2022/4/e34394/>

Occupational stress and work engagement among military police officers

Background: This paper investigates the levels of occupational stress and work engagement among military police officers. **Methods:** This cross-sectional, descriptive, and analytical study was conducted with 268 police officers from the 3rd Military Police Battalion of Paraná state. **Results:** We observed significant levels of occupational stress in 125 (46.7%) police officers. The main stressors were lack of career growth prospects (3.7; ± 1.3); inadequate training (3.4; ± 1.2); discrimination/favoritism in the work environment (3.1; ± 1.4); long working hours (3.0; ± 1.4); distribution of tasks (2.7; ± 1.1); control type (2.7; ± 1.1); gaps in disclosing information about organizational decisions (2.7; ± 1.2); low valuation (2.7; ± 1.2). Levels of work engagement ranged from 3.8 [medium] to 4.1 [high]. The correlation between occupational stress and work engagement was low for the dimensions of Absorption ($r: -.284$; $p < 0.001$) and Overall Score ($r: -0.393$; $p < 0.001$) and moderate for the dimensions Vigor ($r: -0.422$; $p < 0.001$) and Dedication ($r: -0.414$; $p < 0.001$). **Conclusion:** We concluded that an important number of police officers had shown occupational stress. However, they displayed good levels of work engagement and are enthusiastic, inspired, and proud of their work.

Dos Santos et al. 2022.

Ciencia & Saude Coletiva, vol. 26, no. 12.

User License:

Keywords: Occupational stress; work engagement; military; police.

Evidence Level: 4B

Link: <https://www.scielo.br/j/csc/a/H96LNxsR5T6TpspRQGnc8gN/?lang=en>

Research on the influencing factors of fatigue and professional identity among CDC workers in China: An online cross-sectional study

Background: This study aimed to investigate the status quo and the influencing factors of fatigue and professional identity among the Centers for Disease Control and Prevention (CDC) workers in China during the pandemic. **Methods:** A cross-sectional design. Setting: CDC workers employed by the Liaoning CDC system were enrolled (administrative staffs were excluded). Participants: 1020 CDC workers. Primary outcome measures: Fatigue scores and professional identity scores. Secondary outcome measures: Postcompetency scores, respect scores, occupational stress scores, resilience scores and self-efficacy scores. **Results:** The average scores of fatigue and professional identity were 8.23, 38.88, respectively. Factors including perceived public respect ($\beta = -0.129$, $p < 0.01$), resilience ($\beta = -0.104$, $p < 0.05$) and self-efficacy ($\beta = -0.22$, $p < 0.01$) were negatively associated with fatigue. Educational background (bachelor vs junior college or below) ($\beta = 0.105$, $p < 0.01$), (master or above vs junior college or below) ($\beta = 0.092$, $p < 0.05$), workplace (county vs district) ($\beta = 0.067$, $p < 0.05$), (city vs district) ($\beta = 0.085$, $p < 0.05$), fighting the COVID-19 on the front line ($\beta = 0.059$, $p < 0.05$) and occupational stress ($\beta = 0.166$, $p < 0.01$) were positively correlated with fatigue. Educational background (bachelor vs junior college or below) ($\beta = -0.097$, $p < 0.01$), (master or above vs junior college or below) ($\beta = -0.114$, $p < 0.01$), workplace (city vs district) ($\beta = -0.114$, $p < 0.01$), fighting the COVID-19 on the front line ($\beta = -0.047$, $p < 0.05$) and occupational stress ($\beta = -0.105$, $p < 0.01$) were negatively associated with professional identity. Factors including postcompetency ($\beta = 0.362$, $p < 0.01$), perceived public respect (general vs low) ($\beta = 0.219$, $p < 0.01$), (high vs low) ($\beta = 0.288$, $p < 0.01$), resilience ($\beta = 0.097$, $p < 0.05$) and self-efficacy ($\beta = 0.113$, $p < 0.01$) were positively connected with professional identity. **Conclusion:** The fatigue among the CDC workers was at a higher level. The level of professional identity was high, and administrators should take measures to alleviate fatigue and maintain professional identity. In addition, methods aiming to attenuate occupational stress, and improve resilience and self-efficacy should be immediately put into action.

Cui et al. 2022.

BMJ Open, vol. 12, no. 4.

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Keywords: Depression and mood disorders; mental health; public health.

Evidence Level: 4B

Link: <https://bmjopen.bmj.com/content/12/4/e058762.long>

Impact of depression onset and treatment on the trend of annual medical costs in Japan: An exploratory, descriptive analysis of employer-based health insurance claims data

Background: We aimed to clarify medical expenses in Japanese individuals before and after major depressive disorder (MDD) diagnosis, and to determine whether MDD treatment also reduces medical costs for comorbid physical conditions. **Methods:** This was an exploratory, descriptive, retrospective analysis of insurance claims data from JMDC Inc. Cohort A included individuals aged 18-64 years between January 2015 and December 2019. Cohorts B and C included Cohort A individuals with diabetes/hypertension ('chronic disease'), and sleep/anxiety disorders ('high depression risk'), respectively. Individuals in Cohorts A-C with an MDD diagnosis were analyzed by year of MDD onset (Cohorts A-C_{MDD2015-2019}). Diagnoses and median medical costs were derived from International Classification of Diseases 10 codes. **Results:** Total medical and non-neuropsychiatric drug costs in MDD onset years were 170,390-182,120 and 8480-9586 yen higher, respectively, for Cohorts A_{MDD2015-2019} than for Cohort A. In Cohort A_{MDD2019}, total medical and non-neuropsychiatric drug costs increased incrementally from 2015 to 2019 (total changes: + 165,130 and + 7365 yen, respectively), to a greater degree than in Cohort A (+ 10,510 and + 1246 yen, respectively). Neuropsychiatric drug costs increased in the year of MDD onset only and decreased thereafter. After MDD onset, decreases in total medical and non-neuropsychiatric drug costs were observed (Cohorts A_{MDD2015-2019}). Non-neuropsychiatric drug costs also decreased after MDD onset in the chronic disease groups (Cohorts C_{MDD2015-2019}), but not in patients with MDD recurrence. **Conclusion:** Treating MDD reduces medical costs for comorbid physical conditions and may be a useful strategy for improving healthcare efficiency in Japan.

Cho et al. 2022.

Advances in Therapy, vol. 39, no. 4.

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

Keywords: Antidepressants; comorbidities; exploratory, descriptive analysis; insurance claims data; JMDC; japan; major depressive disorder; neuropsychiatric drug costs; non-neuropsychiatric drug costs.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007/s12325-021-01963-9>

The self-reported stress and stressors in tram and long-haul truck drivers

Background: Work stress may compromise professional drivers' health and driving capacity. Differences between driver groups in terms of on-duty stress are understudied. **Methods:** We examined self-reported stress (Stockholm University Stress Scale) of shift-working tram and long-haul truck drivers (n = 75) across 2-3 weeks. Furthermore, stressors were self-reported retrospectively and categorised as related to the job, driving conditions, personal, or other causes. **Results:** Stress levels were generally low, but moderate to high stress (≥ 6) was more frequently reported among the tram drivers. Stressors related to the job (54%) and driving conditions (19% of all shifts) were frequently reported among the tram and truck drivers, respectively. Moderate to high stress was associated with categorised stressors related to the job and other causes among the tram drivers, and all categorised stressors among the truck drivers. **Conclusion:** Altogether, self-reported stress and stressors differ by driver group, but the role of shift type is less significant.

Onninen et al. 2022.

Applied Ergonomics, vol. 102.

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

Keywords: Driving; shift work; stress.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S0003687022000849?via%3Dihub>

The impact of artificial intelligence on the mental health of manufacturing workers: The mediating role of overtime work and the work environment

Background: Work-related mental health and psychological injuries are important issues related to people's livelihood and wellbeing. Currently, digitalization and intelligent technology have an extremely

large impact on the workforce. China is actively promoting the deep integration of artificial intelligence (AI) and manufacturing, which may have important implications for the mental health of manufacturing workers. However, existing researches have paid little attention to the influence of AI on the mental wellbeing of workers in China. There is a lack of relevant empirical research, and the findings in existing studies are inconsistent. **Methods:** Using data from the 2018 China Labor Force Dynamics Survey, this paper studies the impact of AI on the depressive symptoms of manufacturing workers and uses stepwise and bootstrapping methods to test whether overtime work and the work environment exhibit mediating effects. Robustness tests were performed by using alternative measures for the dependent and mediating variables. Finally, the heterogeneity in the impact of AI by skill level and generation was examined.

Results: AI can reduce the psychological depression scores of manufacturing workers by 1.643 points, which indicates that AI promotes workers' mental health. Working overtime is not a mediator between AI and mental health. However, the work environment is a mediator between AI and the mental health of manufacturing workers: it explains 11.509% of workers' mental health. The impact of AI on the mental health of manufacturing workers varies by skill level and generation. AI improves the mental health of low-skilled manufacturing workers by 2.342 points and that of manufacturing workers born before the 1980's by 2.070 points. **Conclusions:** The application of AI is conducive to improvements in the mental health of manufacturing workers. Improving the work environment is a powerful way to increase the positive effects of AI on workers' mental health. The impact of AI on the mental health of manufacturing workers varies by skill level and generation. The mental health of low-skilled workers and workers born after 1980 is affected more positively by the adoption of AI.

Wei et al. 2022.

Frontiers in Public Health, vol. 11.

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Keywords: Artificial intelligence; manufacturing industry; mental health; overtime work; work environment.

Evidence Level: 4B

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2022.862407/full>

Improved intention, self-efficacy and social influence in the workspace may help low vision service workers to discuss depression and anxiety with visually impaired and blind adults

Background: Depression and anxiety are common in visually impaired and blind adults, but often remain untreated in those who receive support from low vision service (LVS) organizations. This study aims to determine factors associated with discussing mental health by LVS workers. **Methods:** A self-administered cross-sectional survey in one hundred LVS workers was performed. Data on current practice, symptom attribution, and determinants of the Integrated Change Model (i.e. predisposing and environmental factors, awareness, attitude, self-efficacy, social influence, confidence and barriers) were investigated.

Multivariable logistic regression analysis was performed to determine predictors of discussing mental health problems in this population. Subsequently, internal validation was conducted using a bootstrapping method. **Results:** Around 80% of the participants often discussed mental health with clients. Five factors were found to predict discussion of mental health: female gender (OR = 4.51; 95% confidence interval (CI) 0.98 to 21.61), higher education (OR = 3.39; CI 1.19 to 9.66), intention to discuss mental health problems (OR = 3.49; CI 1.20 to 10.15), higher self-efficacy (OR = 1.11; CI 1.02 to 1.20), and higher perceived social influence (OR = 1.15; CI 1.05 to 1.27). Good discrimination after internal validation was reflected by the area under the curve (0.850). **Conclusions:** Previous studies indicate clients want healthcare providers to initiate discussions about mental health. However, still 20% of LVS workers do not discuss suspected depression or anxiety. In order to improve this, LVS organizations could address mental health as part of their care and provide training to ensure intention to discuss mental health problems, improve self-efficacy and create a supportive environment between colleagues.

van Munster et al. 2022.

BMC Health Services Research, vol. 22, no. 1.

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Keywords: Anxiety; depression; detection; low vision; professional development; vision impairment.

Evidence Level: 4B

Link: <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-022-07944-0>

Differences in occupational stress by smoking intensity and gender in cross-sectional study of 59 355 Japanese employees using the Brief Job Stress Questionnaire (BJSQ): the Niigata Wellness Study

Background: It has been hypothesised that smoking intensity may be related to occupational stress. This study aimed to investigate whether stress, including problems with superiors or co-workers, is a driver of smoking. **Design:** Cross-sectional study. **Setting and participants:** 59 355 employees (34 865 men and 24 490 women) across multiple occupations who completed a self-reported questionnaire-based occupational stress survey between April 2016 and March 2017 in Niigata Prefecture. **Main outcome measures:** Stress scores for the Brief Job Stress Questionnaire subscales summed up after assigning high points for high stress and converted to Z-scores based on the mean of all participants. Heavy smokers (HS) smoked ≥ 15 cigarettes/day and light smokers (LS) smoked < 15 cigarettes/day and were compared with non-smokers (NS) by gender. **Results:** The main subscale items that were significantly associated with smoking status in both genders included 'physical burden', 'irritation' and 'physical symptoms'. In the analysis that included smoking intensity, the stress score for 'co-workers' support' was significantly lower for LS men than NS men (NS 0.091 ± 0.98 , LS -0.027 ± 1.00 , HS 0.033 ± 0.99), and was significantly higher for HS women than NS women (NS -0.091 ± 1.00 , LS -0.080 ± 1.05 , HS 0.079 ± 1.03). However, the stress score for 'co-workers' support' was low among LS women aged ≤ 39 years in the manufacturing industry. **Conclusions:** It was speculated that LS men and some LS women gained 'co-workers' support' using smoking as a communication tool while reducing the degree of smoking. The existence of such 'social smokers' suggested that to promote smoking cessation, measures are essential to improve the communication between workers in addition to implementing smoking restrictions in the workplace.

Tashiro et al. 2022.

BMJ Open, vol. 12, no. 4.

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Keywords: Mental health; occupational & industrial medicine; preventive medicine; public health.

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8995962/>

Adverse employment histories and allostatic load: associations over the working life

Background: Most studies on the health impact of occupational stress use single-point measures of stress at work. This study analyses the associations of properties of entire employment trajectories over an extended time period with a composite score of allostatic load (AL). **Methods:** Data come from the French CONSTANCES cohort, with information on adverse employment histories between ages 25 and 45 and a composite score of AL (based on 10 biomarkers, range 0-10) among people aged 45 or older (47 680 women and 45 035 men). Data were collected by questionnaires (including retrospective employment histories) or by health examinations (including blood-based biomarkers). We distinguish six career characteristics: number of temporary jobs, number of job changes, number of unemployment periods, years out of work, mode occupational position and lack of job promotion. **Results:** For both men and women, results of negative binomial regressions indicate that adverse employment histories are related to higher levels of AL, particularly histories that are characterised by a continued disadvantaged occupational position, repeated periods of unemployment or years out of work. Findings are adjusted for partnership, age and education, and respondents with a health-related career interruption or early retirement are excluded. **Conclusions:** Our study highlights physiological responses as a mechanism through which chronic stress during working life is linked to poor health and calls for intervention efforts among more disadvantaged groups at early stages of labour market participation.

Wahrendorf et al. 2022.

Journal of Epidemiology and Community Health, vol. 76, no. 4.

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Keywords: Employment; life course epidemiology; occupational health; work stress.

Evidence Level: 4B

Link: <https://jech.bmj.com/content/76/4/374.long>

Bullying and Harassment

This month we explore workplace bullying amongst carers and civil servants, the effect of social support on workplace bullying during covid-19 and the relationship between bullying and changing jobs

Exploring the workplace bullying of Indonesian caregivers and its influencing factors in Taiwan

Background: Bullying can pose a risk to the health and safety of humans, including the risk of damage to the emotional, psychosocial, mental, or physical health of employees in the workplace. In this study, we aimed to understand the personal characteristics, mental health, sleep quality, and workplace bullying status of Indonesian caregivers and explore the influencing factors of workplace bullying among them.

Methods: This cross-sectional study was based on a structured questionnaire in Indonesian, which was designed to collect the data of essential personal characteristics, workplace bullying, sleep quality, and mental health using the Indonesian versions of the Negative Acts Questionnaire-Revised (NAQ-R), Pittsburgh Sleep Quality Index (PSQI), and the Brief Symptoms Rating Scale (BSRS-5). **Results:** A total of 60.9% of Indonesian caregivers never experienced workplace bullying in Taiwan. A multiple regression analysis revealed that being a household caregiver ($\beta = 0.14, p = 0.021$), sleep quality ($\beta = 0.18, p = 0.031$), and mental health ($\beta = 0.44, p < 0.001$) were significantly correlated with overall workplace bullying scores of the respondents and revealed that these three variables explained 45% of the variance.

Conclusions: Taiwan Indonesian caregivers have a similar workplace bullying rate to Indonesian employees in the workplace. This study indicated the relationships among the workplace bullying of foreign caregivers and demonstrated that being a household caregiver, sleep quality, and mental health were closely related.

Lu et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 18.

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Keywords: Indonesian caregivers; mental health; sleep quality; workplace bullying.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/8/4909>

Association between workplace bullying and common mental disorders in civil servants from a middle-income country

Background: Workplace bullying (WB) is associated with Common mental disorders (CMD) in high-income countries, but there is a lack of evidence relating to this subject in low- and middle-income countries.

Therefore, this study aimed to investigate the association between bullying and CMD in Brazil. **Methods:** A cross-sectional study with 907 judicial civil servants from Porto Alegre, southern Brazil, was carried out. WB was measured by the Negative Acts Questionnaire (NAQ-r) and CMD by the Self-Reporting Questionnaire (SRQ-20). Logistic regression was used to analyse data and test hypotheses. **Results:** The overall prevalence of CMD was 32.8%, while the overall prevalence of bullying was 18.3%. WB was strongly associated with CMD, even after controlling for confounders. After adjustment for sociodemographic, personality and occupational confounders, weekly and daily exposures to negative acts increased 4.32 (95% CI: 2.00-9.33) and 6.80 (95% CI: 3.42-13.51) times the risk of CMD, respectively. Considering the operational definition, bullied workers had a 3.45 (95% CI: 2.26-5.25) higher risk of CMD. **Conclusion:** The results are consistent with studies from high-income countries. Different ways of categorising exposure to WB and testing association with CMD are suggested. Interventions to prevent bullying, focusing on work processes and psychosocial factors at work, could reduce the risk of mental health problems.

Feijó et al. 2022.

Industrial Health, vol. 60, no. 2.

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Keywords: Common mental disorders; epidemiology; occupational health; psychosocial factors at work; workplace bullying.

Evidence Level: 4B

Link: https://www.jstage.jst.go.jp/article/indhealth/60/2/60_2021-0049/article

Does social support matter in the workplace? Social support, job satisfaction, bullying and harassment in the workplace during COVID-19

Background: This study aims to examine social support at work amongst the employees of Icelandic municipalities and its relationship to job satisfaction, bullying and harassment. **Methods:** The study is based on an online survey conducted in 2021. A total of 4973 employees answered the questionnaire in part or in full after three reminders (57% response rate). The majority of the participants in the study were women (82%), but this gender ratio was representative of the population. **Results:** The results show that social support gave an average score of 4.2 on a scale of 1-5; 87% of the participants were rather often or always satisfied with their job, 8% had experienced bullying at work, 2% had experienced sexual harassment and 3% had experienced gender-based harassment. Social support has a positive, moderately strong correlation with employee job satisfaction and a weak negative correlation with bullying at work. **Discussion:** Based on the results, social support is an important factor related to the job satisfaction of employees and is a protective factor against bullying and sexual harassment at work. This finding demonstrates that managers and those responsible for employee well-being in the workplace should focus on social support at work, especially now that the psychosocial work environment is fragile because of COVID-19.

Sigursteinsdottir et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 8.

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Keywords: Bullying; harassment; job satisfaction; social support; well-being at work.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/8/4724>

The last resort: Workplace bullying and the consequences of changing jobs

Background: This study investigated the consequences of changing jobs for employees subjected to workplace bullying. First, we hypothesized that bullied employees would be more likely to change jobs than non-bullied employees. Moreover, we hypothesized that changing jobs would result in a reduction of exposure to bullying behaviors and an alleviation of mental health problems for those bullied at baseline. **Methods:** The study was based on a longitudinal probability sample of the whole Swedish workforce (n = 1,095). The time lag was 18 months. **Results:** The results supported all hypotheses except one. Those employees who were bullied at baseline were more likely to have changed jobs at follow-up. Also, for the changers there was a reduction in exposure to subsequent bullying. The actual drop in exposure to bullying behaviors was significant and substantial. This gives further support for the work environment hypothesis, suggesting the work context may be a more important cause than individual characteristics. As for mental health problems, the association between bullying and subsequent anxiety was not significant for those changing jobs, suggesting that leaving a toxic workplace may reduce anxiety relatively quickly. However, depression symptoms were not affected by the change of jobs, and the association between bullying and subsequent depression was the same 18 months later. **Conclusion:** The conclusion is that changing jobs can be a useful, last resort on an individual level, improving the situation for the victim of bullying. However, it is important to note that it does not solve any underlying organizational problems and risk factors.

Rosander et al. 2022.

Scandinavian Journal of Psychology, vol. 63, no. 2.

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Keywords: Workplace bullying; anxiety; depression; employee turnover; job change; mental health problems.

Evidence Level: 4B

Link: <https://onlinelibrary.wiley.com/doi/10.1111/sjop.12794>

Psychosocial Issues

This month explores psychosocial issues related to employee competency and organizational culture, the use of respiratory and hearing protection, the role of emotional exhaustion and job autonomy, weight-based stereotypes, and comorbid pain and depression. Psychosocial aspects related to demographic influences, work situation and life satisfaction are also explored specifically related to the covid pandemic.

The effect of employee competency and organizational culture on employees' perceived stress for better workplace

Background: Although the meaningful relationship between organizational culture and employee performance is a widely-researched topic, there is scant research available how organizational culture impacts on employees' perceived stress in the workplace, affecting their performance. This might cause a difficulty to guide practitioners as to what organizational elements can be applied to reduce employee perceived stress. **Methods:** To add the level of robustness and fill the gap in the literature, the present research explores the effect of organizational culture with employee competency on workers' perceived stress which has emerged as a common occupational disease and affected employees psychologically and physically; thus, affecting their performance. **Results:** Using 641 responses, the statistical findings of the present research insists that HR practitioners should match the type of organizational culture and employee competency situationally to reduce employee stress. **Conclusion:** The current authors suggest that organizations desiring the adaptability competencies (Professional competency) for their employees should build a clan organizational culture. In contrast, organizations should encourage a market organizational culture for their employees who possess customer orientation competency (Simply result-oriented competency). The research outcomes provide additional knowledge to the existing literature, enhance academicians' understanding of the research topic, and serve as a significant knowledge base for further empirical research.

Kim et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 18.

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Keywords: Employee competency; employee perceived stress; organizational culture.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/8/4428>

The contribution of respiratory and hearing protection use to psychological distress in the workplace: A scoping review

Background: Workers from various industries use personal protective equipment (PPE) including masks, respirators, and hearing protection to reduce their exposures to workplace hazards. Many studies have evaluated the physiological impacts of PPE use, but few have assessed the psychological impacts. The aim of the present study was to carry out a scoping review to compile existing evidence and determine the extent of knowledge on workplace mask, respirator or hearing protection use as a psychosocial hazard (stressor) that could result in a stress response and potentially lead to psychological injury. **Methods:** The scoping review followed recognized methods and was conducted using Ovid Emcare, PubMed, Sage Journals, ScienceDirect, Scopus, SpringerLink, Google Scholar and preprint databases (OSF Preprints and medRxiv). Articles on the stressors associated with the use of masks, respirators, and hearing protection were included. The extracted data included author(s) name, year of publication, title of article, study design, population data, stressors assessed, and key findings. **Results:** We retrieved 650 articles after removal of duplicates, of which 26 were deemed eligible for inclusion for review. Identified factors associated with PPE use that could potentially create a stress response were identified: communication impacts, physical impacts, psychological illness symptoms, cognitive impacts, and perceived PPE-related impacts. Evidence for respirators suggest that there may be psychological injury associated with their use. However, hearing protection appears to have a protective effect in reducing psychological symptoms such as anxiety, depression, and aggression. **Conclusion:** Mask or respirator use may lead to an increase in work-related stress. Whereas hearing protection may have protective effects against psychological symptoms

and improves speech intelligibility. More research is needed to better understand potential psychosocial impacts of mask, respirator and/or hearing protection use.

Leung et al. 2022.

International Archives of Occupational and Environmental Health, vol. 26, no. 1-13.

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Keywords: Hearing protection; masks; mental health; respirators; stress.

Evidence Level: 6A

Link: <https://link.springer.com/article/10.1007/s00420-022-01863-7>

Work-family conflict and withdrawal behavior among mainland China's IT employees: The mediating role of emotional exhaustion and moderating role of job autonomy

Background: Since the turn of the millennium, the information technology (IT) industry has been growing rapidly in mainland China. One of the significant characteristics of IT employees in mainland China during the past decades was that they tended to work more overtime, which might result in more work-family conflicts and higher turnover rates. **Methods:** Our study tested the mechanism of work-family conflict and work withdrawal behaviours using data from 389 IT employees in mainland China. Using the job demands-resources model and the conservation of resources theory, we examined the mediating effect of emotional exhaustion and the moderating effect of job autonomy. **Results:** The results indicated that work-to-family conflict was negatively related with work withdrawal behaviours, whereas family-to-work conflict was positively related with work withdrawal behaviours. Moreover, we found the opposite moderating role of job autonomy, which enhanced the relationships between emotional exhaustion and work withdrawal behaviours. That is, the relationship was stronger among employees with higher job autonomy than among those with lower job autonomy. **Conclusion:** These findings indicate that work-family conflict relates to employees' psychological well-being and behaviour, and that job autonomy might play a special role between work-family conflict and work withdrawal behaviours.

Hou et al. 2022.

Industrial Health, vol. 20.

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Keywords: Emotional exhaustion; information technology; job autonomy; work withdrawal behaviors; work-family conflict.

Evidence Level: 5B

Link: https://www.istage.jst.go.jp/article/indhealth/advpub/0/advpub_2021-0136/_article

Weight-based stereotype threat in the workplace: Consequences for employees with overweight or obesity

Background: Employees with overweight or obesity are often stereotyped as lazy, unmotivated, and less competent than employees with normal weight. As a consequence, employees with overweight or obesity are susceptible to stereotype threat, or the concern about confirming, or being reduced to, a stereotype about their group. This survey study examined whether employees with overweight or obesity experience stereotype threat in the workplace, whether it is associated with their perceived ability to meet their work demands (i.e., work ability), and whether high levels of knowledge about one's self (i.e., authentic self-awareness) can offset a potential negative association. **Methods:** Using a correlational study design, survey data were collected from N = 758 full-time employees at three measurement points across 3 months. Employees' average body mass index (BMI) was 26.36 kg/m² (SD = 5.45); 34% of participants were employees with overweight (BMI between 25 and <30), and 18% of participants were employees with obesity (BMI > 30). **Results:** Employees with higher weight and higher BMI reported more weight-based stereotype threat (rs between 0.17 and 0.19, p < 0.001). Employees who experienced higher levels of weight-based stereotype threat reported lower work ability, while controlling for weight, height, and subjective weight ($\beta = -0.27$, p < 0.001). Authentic self-awareness moderated the relationship between weight-based stereotype threat and work ability ($\beta = 0.14$, p < 0.001), such that the relationship between stereotype threat and work ability was negative among employees with low authentic self-awareness ($\beta = -0.25$, p < 0.001), and non-significant among employees with high authentic self-awareness ($\beta = 0.08$, p =

0.315). **Conclusions:** The findings of this study contribute to the literature by showing that weight-based stereotype threat is negatively associated with employees' perceived ability to meet their work demands, particularly among those employees with low authentic self-awareness.

Zacher et al. 2022.

International Journal of Obesity, vol. 46, no. 4.

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Keywords: Obesity; overweight; stereotype; workplace.

Evidence Level: 4B

Link: <https://www.nature.com/articles/s41366-021-01052-5>

Associations between coping profile and work performance in a cohort of Japanese employees

Background: This study aimed to investigate the effects of coping profiles on work performance. **Methods:** Data were collected during a 2-year prospective cohort study of 1359 employees in Japan. Participants completed a self-administered questionnaire in 2018 (T1; baseline) and again in 2020 (T2; followup; followup rate: 69.8%) to enable the assessment of work performance, perceived stress, and stress coping profiles at T1 and T2. Multivariate logistic regression models and causal mediation analysis were performed to identify the effects of coping profiles on work performance. Covariates included age, sex, company, job type, employment status, working hours, holidays, and lifestyle behaviors (e.g., smoking, sleep duration). **Results:** A dysfunctional coping profile ($\beta = -1.17$ [95% CI, -2.28 to -0.06], $p = 0.039$) was negatively associated with work performance. Coping profiles of planning ($\beta = 0.86$ [95% CI, 0.07-1.66]) and self-blame ($\beta = -1.33$ [95% CI, -1.96 to -0.70], $p < 0.001$) were significantly associated with work performance. Dysfunctional coping, specifically, self-blame ($\beta = -1.22$ [95% CI, -1.83 to -0.61]), mediated the association between stress and work performance. Thus, some coping profiles may lead to an increase or decrease in work performance. **Conclusion:** The possible impact of coping strategies on workers' productivity requires further exploration. Furthermore, information on effective coping profiles should be incorporated into occupational health examinations.

Otsuka et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 18.

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Keywords: Japan; cohort study; coping profiles; productivity; work stress.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/19/8/4806>

Risk-targeted behavioral activation for the management of work disability associated with comorbid pain and depression: A feasibility study

Background: The purpose of the present study was to conduct a preliminary evaluation of the feasibility and impact of a risk-targeted behavioral activation intervention for work-disabled individuals with comorbid pain and depression. **Methods:** The design of the study was a single-arm non-randomized trial. The sample consisted of 66 work-disabled individuals with comorbid pain and depression. The treatment program consisted of a 10-week standardized behavioral activation intervention supplemented by techniques to target two psychosocial risk factors for delayed recovery, namely, catastrophic thinking and perceptions of injustice. Measures of pain severity, depression, catastrophic thinking, perceived injustice, and self-reported disability were completed pre-, mid-, and post-treatment. Satisfaction with treatment was assessed at post-treatment. Return to work was assessed at 6-month follow-up. **Results:** The drop-out rate was 18%. At treatment termination, 91% of participants indicated that they were "very" or "completely" satisfied with their involvement in the treatment program. Significant reductions in pain (Cohen's $d = 0.71$), depression ($d = 0.86$), catastrophic thinking ($d = 1.1$), and perceived injustice ($d = 1.0$) were observed through the course of treatment. In multivariate analyses, treatment-related reductions in depression, catastrophic thinking, and perceived injustice, but not pain, contributed significant unique variance to the prediction of return-to-work outcomes. **Conclusions:** Risk-targeted behavioral activation was found to be an acceptable and effective intervention for work-disabled individuals with comorbid pain and depression. The findings suggest that interventions targeting psychosocial risk factors for pain and

depression might contribute to more positive recovery outcomes in work-disabled individuals with comorbid pain and depression.

Sullivan et al. 2022.

Pilot and Feasibility Studies, vol. 8, no. 1.

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Keywords: Depression; musculoskeletal; pain; rehabilitation.

Evidence Level: 3A

Link: <https://pilotfeasibilitystudies.biomedcentral.com/articles/10.1186/s40814-022-01040-0>

Demographic influences on perceived stressors of construction workers during the COVID-19 pandemic

Background: Construction work is one of the most stressful occupations in the world, and the COVID-19 pandemic has only exacerbated this reality. **Methods:** This research conducted a detailed investigation on the perceived stressors of different demographic groups among construction workers. Empirical data were collected using a structured questionnaire in the Chinese construction industry. The empirical data were processed using both an independent sample *t*-test and an Analysis of Variance (ANOVA). **Results:** The findings indicated that male workers reported greater workloads than did females. Married workers experienced more pandemic fear and job insecurity, and they were more sensitive to the poor working environment. Highly-educated workers were inclined to be more satisfied with organizational pandemic responses, and had lower job insecurity and role ambiguity, but they experienced heavier workloads. In addition, the differences in work experience and age were statistically significant with regards to job insecurity. **Conclusion:** This research contributes to the body of knowledge by giving a comprehensive understanding of demographic influences on perceived stressors among construction workers. It also provides valuable insights to identify sensitive demographic groups and promote their health and wellbeing during and after the pandemic.

Liang et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 18.

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Keywords: COVID-19; construction workers; demographic influences; occupational health; perceived stressors.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/7/4192>

Association between work situation and life satisfaction during the COVID-19 pandemic: prospective cohort study in Norway

Background: To estimate the impact of being laid off from work, having to work from home or having been diagnosed with COVID-19 on self-reported satisfaction with life. **Design:** Nationwide population-based cohort study. **Setting:** Norway. **Participants:** We followed more than 80 000 participants in an ongoing cohort study, the Norwegian Mother, Father and Child Cohort Study (MoBa), during the COVID-19 pandemic. We analysed current life satisfaction in April and again in September/October 2020 for subjects whose work situation and infection status had changed. **Main outcome measures:** Self-reported satisfaction with life, using a scale from 0 (worst) to 10 (best). We analysed the scale both continuously and as a binary variable (<or ≥6). **Results:** Temporary and permanent layoffs, working from a home-based office, and getting a COVID-19 diagnosis were all associated with modestly, but significantly lower concurrent life satisfaction, both in the total on a population level and for subjects experiencing a change in job status between spring and autumn. The associations with change in work situation were stronger for men. For men with permanent job loss, the adjusted odds ratio (OR) for low life satisfaction (<6) was 3.2 (95% CI 2.4 to 4.2) in April and 4.9 (95% CI 3.5 to 6.9) in autumn. Among all, a suspected or confirmed COVID-19 diagnosis was associated with an adjusted OR for low life satisfaction of 1.9 (95% CI 1.6 to 2.3) in spring. The strength of associations between work situation and life satisfaction did not vary much across socio-economic strata, but layoffs were more common among those with low education.

Conclusion: Layoffs, home office and infection status had clear impact on the quality of life as measured with a global life satisfaction scale. These findings suggest that social differentials in quality of life, are increasing during the pandemic.

Carlsen et al. 2022.

BMJ Open, vol. 12, no. 4.

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Keywords: COVID-19; epidemiology; mental health.

Evidence Level: 4B

Link: <https://bmjopen.bmj.com/content/12/4/e049586.long>

Enabling Healthy and Safe Workplaces

Health and Wellbeing

This month explores the relationship between health and wellbeing and changes in work/sleep patterns due to COVID-19 pandemic, the role of specific occupational groups, health check documentation, working conditions and the frequency of face-to-face interactions with the public at work.

Association of changes in work due to COVID-19 pandemic with psychosocial work environment and employee health: A cohort study of 24 299 Finnish public sector employees

Objectives: To examine the associations of COVID-19-related changes in work with perceptions of psychosocial work environment and employee health. **Methods:** In a cohort of 24 299 Finnish public sector employees, psychosocial work environment and employee well-being were assessed twice before (2016 and 2018=reference period) and once during (2020) the COVID-19 pandemic. Those who reported a change (= 'Exposed') in work due to the pandemic (working from home, new tasks or team reorganisation) were compared with those who did not report such change (= 'Non-exposed'). **Results:** After adjusting for sex, age, socioeconomic status and lifestyle risk score, working from home (44%) was associated with greater increase in worktime control (standardised mean difference (SMD)_{Exposed}=0.078, 95% CI 0.066 to 0.090; SMD_{Non-exposed}=-0.025, 95% CI 0.014 to 0.036), procedural justice (SMD_{Exposed}=-0.101, 95% CI 0.084 to 0.118; SMD_{Non-exposed}=0.053, 95% CI 0.038 to 0.068), workplace social capital (SMD_{Exposed}=0.094, 95% CI 0.077 to 0.110; SMD_{Non-exposed}=0.034, 95% CI 0.019 to 0.048), less decline in self-rated health (SMD_{Exposed}=-0.038, 95% CI -0.054 to -0.022; SMD_{Non-exposed}=-0.081, 95% CI -0.095 to -0.067), perceived work ability (SMD_{Exposed}=-0.091, 95% CI -0.108 to -0.074; SMD_{Non-exposed}=-0.151, 95% CI -0.167 to -0.136) and less increase in psychological distress (risk ratio (RR)_{Exposed}=1.06, 95% CI 1.02 to 1.09; RR_{Non-exposed}=1.16, 95% CI 1.13 to 1.20). New tasks (6%) were associated with greater increase in psychological distress (RR_{Exposed}=1.28, 95% CI 1.19 to 1.39; RR_{Non-exposed}=1.10, 95% CI 1.07 to 1.12) and team reorganisation (5%) with slightly steeper decline in perceived work ability (SMD_{Exposed}=-0.151, 95% CI -0.203 to -0.098; SMD_{Non-exposed}=-0.124, 95% CI -0.136 to -0.112). **Conclusion:** Employees who worked from home during the pandemic had more favourable psychosocial work environment and health, whereas those who were exposed to work task changes and team reorganisations experienced more adverse changes.

Ervasti et al. 2022.

Occupational and Environmental Medicine, vol. 79, no. 4.

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Keywords: COVID-19; environment; occupational health; occupational stress; workload.

Evidence Level: 4B

Link: <https://oem.bmj.com/content/79/4/233.long>

Occupational groups and its physical and mental health correlates: Results from the Singapore Mental Health Study 2016

Background: The physical and mental wellbeing of an individual is impacted by the type occupation one does. This study aims to establish the prevalence of mental and physical disorders, the association of occupational groups and health-related quality of life, and the extent of work-loss and work-cut back in past 30 days among the employed in the Singapore resident population. **Methods:** Data from a population-based, epidemiological survey of a representative sample of Singapore citizens and permanent residents aged 18 years and above were used. Lifetime diagnosis of select mental disorders was established using the

World Health Organization's Composite International Diagnostic Interview version 3.0 (WHO-CIDI 3.0). Data on nicotine dependence, work productivity, quality of life and socio-demographics were obtained via self-report. Ten major occupational groups based on the Singapore Standard Occupational Classification were included in the analysis. **Results:** The sample comprised 4021 employed individuals who were predominantly males (54.7%) and aged 35-49 years (35.4%). 'Service and sales workers' (22.6%), 'Professionals' (17.3%) and 'Legislators, senior officials and managers' (16.4%) were the three largest occupational groups. Socio-demographic characteristics differed significantly ($p < 0.001$) across all occupational groups. Lifetime prevalence of mood disorders among the employed was 8.4% and the most prevalent physical disorder was chronic pain (18.9%). No significant differences were observed in work productivity loss across the occupational groups. **Conclusions:** The disparities in the socio-demographic characteristics and prevalence of mental and physical disorders across occupational categories provide policymakers with vital information to pilot effective interventions that can improve the psychosocial and physical conditions at work.

Sambasivam et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 3.

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Keywords: Mental wellbeing; occupational groups; physical conditions; psychosocial.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007/s00420-021-01741-8>

Combining supervised and unsupervised named entity recognition to detect psychosocial risk factors in occupational health checks

Background: In occupational health checks the information about psychosocial risk factors, which influence work ability, is documented in free text. Early detection of psychosocial risk factors helps occupational health care to choose the right and targeted interventions to maintain work capacity. In this study the aim was to evaluate if we can automate the recognition of these psychosocial risk factors in occupational health check electronic records with natural language processing (NLP). **Methods:** We compared supervised and unsupervised named entity recognition (NER) to detect psychosocial risk factors from health checks' documentation. Occupational health nurses have done these records. **Results:** Both methods found over 60% of psychosocial risk factors from the records. However, the combination of BERT-NER (supervised NER) and QExp (query expansion/paraphrasing) seems to be more suitable. In both methods the most (correct) risk factors were found in the work environment and equipment category. **Conclusion:** This study showed that it was possible to detect risk factors automatically from free-text documentation of health checks. It is possible to develop a text mining tool to automate the detection of psychosocial risk factors at an early stage.

Uronen et al. 2022.

International Journal of Medical Informatics, vol. 160.

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Keywords: Health check; occupational health; psychosocial risk factors; text mining, named entity recognition.

Evidence Level: 5B

Link: [https://linkinghub.elsevier.com/retrieve/pii/S1386-5056\(22\)00009-0](https://linkinghub.elsevier.com/retrieve/pii/S1386-5056(22)00009-0)

Association between loneliness and sleep-related problems among Japanese workers during the COVID-19 pandemic

Background: The coronavirus disease 2019 (COVID-19) pandemic has been linked to a rise in loneliness. Loneliness is associated with sleep-related problems, which in turn can be a risk factor for various psychiatric disorders. However, it is unclear whether loneliness is linked to sleep-related problems during the pandemic. Here, we studied the association between loneliness and sleep-related problems during the COVID-19 pandemic in Japan. **Methods:** A total of 33,302 individuals who indicated they were employed were surveyed online. The survey responses of 27,036 participants were analyzed. Odds ratios (ORs) were estimated using univariate and multiple logistic regression analyses. **Results:** Of those analyzed, 2,750 (10.2%) experienced feelings of loneliness. Further, sleep-related problems were significantly more

common among those who felt lonely both in the short term (more than 3 days) and the long term (more than 3 months). The ORs were much weaker after adjusting for factors related to interpersonal connections, such as family and friendships, than after adjusting for factors related to socioeconomic status. **Conclusion:** Loneliness may be a risk factor for sleep-related problems in the COVID-19 pandemic. Having connections with family and friends may have a moderating effect on the occurrence of sleep-related problems.

Tesen et al. 2022.

Frontiers in Public Health, vol. 10.

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Keywords: COVID-19; Japan; loneliness; sleep; workers.

Evidence Level: 4B

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2022.828650/full>

Effectiveness of workplace interventions for improving working conditions on the health and wellbeing of fathers or parents: A systematic review

Background: Evidence on the effectiveness of workplace interventions for improving working conditions on the health and wellbeing of fathers is scarce. **Methods:** We reviewed studies on the effectiveness of various workplace interventions designed to improve working conditions for the health and wellbeing of employed fathers and their families. Randomized controlled trials (RCTs) and quasi-randomized controlled trials of workplace interventions applied to employees with the aim of improving working conditions of employed parents, compared with no intervention, other active arms, placebo, wait list, or usual practice were included. Studies involving only women were excluded. An electronic search of the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE, PsycINFO, ERIC and SSCI was done for eligible studies. Studies were screened against predetermined criteria and assessment of risk of bias done using the Cochrane Handbook for Systematic Reviews of Interventions for RCTs and the Risk of Bias Assessment tool for Non-randomized Studies for non-RCTs. **Results:** Of the 8229 records identified, 19 reports were included in this review: 14 reports from five RCTs and five reports from two quasi-RCT studies. The studies were conducted in four different countries among working populations from various sectors. Studies addressing issues related to improving working conditions of fathers alone were lacking. All included studies assessed intervention effects on various health-related outcomes, the most common being sleep disturbances and mental health outcomes. Interventions administered yielded positive effects on various health outcomes across all seven studies. All included studies had methodological limitations, while study designs and methodologies lacked comparability. Consequently, a narrative synthesis of evidence is provided. **Conclusion:** Based on our findings, providing workplace interventions for improving working conditions may improve some aspects of the health and wellbeing of employed parents, including fathers.

Suto et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 8.

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Keywords: Fathers; health and wellbeing; job performance; parents; work-life balance; workplace intervention.

Evidence Level: 1A

Link: <https://www.mdpi.com/1660-4601/19/8/4779>

The role of surface acting in the relationship between job stressors, general health and need for recovery based on the frequency of interactions at work

Background: The aim of the study was to verify whether the frequency of face-to-face interactions with the public at work can reveal differences in how people react to emotional regulation demands. In particular, we investigated the mediating role of surface acting (a strategy of dealing with emotional dissonance) in the relationship between two typical job stressors (workload and mental load) and two outcomes closely related to work-related well-being: employees' general health and the need for recovery. Prior studies investigating the detrimental effects of emotional dissonance mostly focused on service workers. **Methods:** In light of a survey conducted by the European Agency for Safety and Health at Work (2016) highlighting the growing psycho-social risk constituted by intense human interactions in the workplaces, even in

unexpected categories of workers, we hypothesize that emotional demands may also be a concern for those who do not specifically interface with clients as part of their job duties. **Results:** The results of the multi-group analysis of front-office ($N = 734$) and back-office ($N = 436$) Italian workers showed that surface acting fully mediates the relationship between workload and general health among back-office workers, while it only partially mediates this relationship among front-office workers. Furthermore, surface acting is positively associated with the need for recovery and negatively with general health, with higher values for back-office workers. **Conclusion:** The findings support the hypothesis that the emotional demands are not only a service worker issue and highlight the need to address emotional regulation strategies to enhance the quality of life in and outside the workplace for all employees.

Sciotto et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 8.

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Keywords: Emotional labor; health; need for recovery; stress; surface acting; wellbeing.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/19/8/4800>

Remote work in a changing world: A nod to personal space, self-regulation and other health and wellness strategies

Background: Remote work has escalated as a result of the coronavirus pandemic, and citizens have been doing their part to mitigate the spread of viral infection. The downside of quickly switching from a workplace office to remote work is that neither employees nor employers have had time to consciously process the new work environment and formally evaluate health and safety concerns. **Methods:** The aim of this commentary was to make suggestions on how to make remote work more satisfying, safe, and healthy for employees. First, I explored existing research on disease outbreaks and mental stress as the backdrop for discussing health-related strategies. To determine which types of strategies or measures would help, next I examined existing organizational research, including a qualitative study by my colleagues on workers' perceptions about what makes a healthy workplace. **Results** Themes that emerged from the qualitative study align with three broad recommendations discussed in this commentary: cultivating personal space, building in ergonomics, and boosting self-regulation (self-learning) skills. **Conclusion:** Finally, I suggested that future research should explore the joint roles of the worker and his/her management team in recognition of organizational commitment to occupational health and safety alongside each worker's need for autonomy in their personal workspace.

Geldart 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 18.

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Keywords: Ergonomics; health and safety; management commitment; remote work; self-regulation.

Evidence Level: 6B

Link: <https://www.mdpi.com/1660-4601/19/8/4873>

Work Health and Safety

This month we explore health and safety related to chemical substances contamination of protective clothing for firefighters, workplace slips, sunscreen use among outdoor construction workers and occupational dermatoses associated with personal protective equipment use. Specifically related to covid 19 studies explore the health and safety related to working from home, couriers' safety and health risks, workplace contact patterns, and masking by health care and public safety workers

Hazard of chemical substances contamination of protective clothing for firefighters – A survey on use and maintenance

Background: The objective of the work was to analyze the impact of selected factors concerning the use and maintenance of firefighters' protective clothing worn during rescue operations on the hazard of

contamination by chemical substances. **Material and methods:** The participants were firefighters (N = 688) from rescue and firefighting units of the State Fire Service in Poland, aged <30, 31-40, 41-50 or >60 years, with different seniority: up to >21 years of service. The survey questionnaire developed by the authors was used. The questionnaire was available online. The Statistica 10.0 statistical package using the χ^2 test was applied in the analysis of the significance of the results. **Results:** As reported by the vast majority (>60%) of the firefighters, the maintenance was carried out after recording an average or a high level of contamination. It was pointed out that removal of the contaminants from protective clothing was difficult (83%). The surfaces of the legs and sleeves of protective clothing were the most contaminated areas. A feeling of discomfort was observed (90%) after returning from firefighting operations due to fire, smoke, or combustion residues. **Conclusions:** It is necessary to conduct training and information actions concerning the use and maintenance of protective clothing and the harmfulness of chemicals contaminating the garments used by firefighters. *Int J Occup Med Environ Health.* 2022;35(2):235-48.

Krzemińska et al. 2022.

International Journal of Occupational Medicine and Environmental Health, vol. 35, no. 2.

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Keywords: Chemical contamination; firefighters; health hazard; maintenance; protective clothing; questionnaire.

Evidence Level: 5B

Link: <http://ijomeh.eu/Hazard-of-chemical-substances-contamination-of-protective-clothing-for-firefighters,142313,0,2.html>

Relationship between age, workplace slips and the effectiveness of slip-resistant footwear among healthcare workers

Background: To explore any age-related trend in workplace slip rate and assess the effectiveness of appropriate slip-resistant footwear in preventing workplace slips by age. **Methods:** Secondary data analysis of the Stopping Slips among Healthcare Workers trial, a two-arm randomised controlled trial conducted between March 2017 and May 2019. 4553 National Health Service (NHS) staff across seven sites in England were randomised 1:1 to the intervention group (provision of 5* GRIP-rated slip-resistant footwear) or the control group (usual work footwear). The primary outcome was self-reported workplace slips, ascertained primarily through weekly text messages throughout the 14-week trial follow-up and analysed using mixed-effects negative binomial regression. This paper reports a control group-only analysis of the association between age and slip rate, and a full intention-to-treat analysis of the effectiveness of slip-resistant footwear by age. **Results:** The mean age of participants was 43 years (range 18-74). In the control group-only analysis, slip rate differed by age ($p < 0.001$) with those aged 60+ having double the slip rate of those aged <30 years (95% CI 1.40 to 2.87). In the intention-to-treat analysis, the interaction between allocation and age was statistically significant ($p = 0.002$). In addition, for all age groups except those aged <30 years, the slip rate in the intervention group was statistically significantly lower than the control group; the smallest incidence rate ratio (ie, the biggest effect) was 0.39 (95% CI 0.24 to 0.64) in the 60+ age group.

Conclusion: The provision of appropriate slip-resistant footwear was more effective at reducing workplace slips for older NHS staff.

Frost et al. 2022.

Injury Prevention, vol. 12.

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Keywords: Interventions; occupational injury; older people; randomized trial; workplace.

Evidence Level: 2B

Link: <https://injuryprevention.bmj.com/content/early/2022/04/11/injuryprev-2022-044533.long>

Stimulating sunscreen use among outdoor construction workers: A pilot study

Background: Outdoor workers (OW) receive a higher dose of ultraviolet radiation (UVR) compared to indoor workers (IW) which increases the risk of non-melanoma skin cancer (NMSC). Regular sunscreen use reduces the NMSC risk, however, adequate sun-safety behavior among OW is poor. The main objective was to conduct method- and intervention-related elements of a future intervention trial among OW, based on

providing sunscreen and assessing sunscreen use on group- and individual level. **Methods:** This pilot study was conducted at a construction site in the Netherlands from May-August 2021. Nine dispensers with sunscreen (SPF 50+) were installed at the worksite. OW ($n = 67$) were invited to complete two (cross-sectional) questionnaires on sun-safety behavior, before and after providing sunscreen. Stratum corneum (SC) samples for the assessment of UV-biomarkers were collected from the forehead and behind the ear from 15 OW and 15 IW. The feasibility of the following elements was investigated: recruitment, (loss to) follow-up, outcome measures, data collection, and acceptability of the intervention. **Results:** The first questionnaire was completed by 27 OW, the second by 17 OW. More than 75 percent of the OW were aware of the risks of sun exposure, and 63% ($n = 17$) found sunscreen use during worktime important. The proportion of OW never applying sunscreen in the past month was 44.4% ($n = 12$) before, and 35.3% ($n = 6$) after providing sunscreen. A majority of OW (59.3%, $n = 16$) found sunscreen provision encouraging for sunscreen use, the dispensers easy to use (64.7%, $n = 17$) and placed in practical spots (58.8%, $n = 18$). Collecting SC-samples was fast and easy, and several UV-biomarkers showed higher levels for sun-exposed compared to less exposed body parts. There was no significant difference in UV-biomarker levels between OW and IW. **Conclusions:** This pilot study revealed low sunscreen use among OW despite providing sunscreen, overall satisfaction with the sunscreen, and the sufficient awareness of the risks of UVR-exposure. Collecting SC-samples at the workplace is feasible and several UV-biomarkers showed to be promising in assessing UVR-exposure. The low participation rate and high loss to follow-up poses a challenge for future intervention studies.

Keurentjes et al. 2022.

Frontiers in Public Health, vol. 10.

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Keywords: Biomarkers; non-melanoma skin cancer; occupational disease; outdoor workers; solar radiation; stratum corneum; sunscreen use; ultraviolet exposure.

Evidence Level: 4B

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2022.857553/full>

Epidemiology of occupational dermatoses associated with personal protective equipment use in the COVID-19 pandemic: Risk factors and mitigation strategies for frontline healthcare workers

Background: Personal protective equipment-related occupational dermatosis (PROD) represents a significant occupational burden to healthcare workers (HCW) and understanding its epidemiology is imperative in formulating mitigation strategies. **Objectives:** Determine the prevalence of PROD in HCW, characterize its manifestations, identify risk factors, and evaluate behavioural modifications of HCW.

Methods: A cross-sectional study using an online questionnaire was conducted from July-September 2020. HCW who had direct contact with COVID-19 patients for a minimum of 2 weeks cumulatively were invited to participate. **Results:** The prevalence of PROD amongst 416 valid respondents was 73.8% (307/416), with face masks being the commonest cause [93.8% (288)]. The commonest PROD associated with face masks, protective eyewear, hair-nets, gowns and gloves were acne [71.5% (206/288)], pressure related injuries [(70.7% (99/140)], scalp itch [53.3% (16/30)], itch/rash [78.8% (26/33)] and xerosis [75.0% (27/36)] respectively. Exposure to PPE beyond an hour increased the odds of PROD by 4.8-fold. Majority of HCW made behavioural modifications to mitigate PROD. **Conclusions:** We underscore evidence-based recommendations for HCW to be (1) scheduled hourly breaks from PPE wear, (2) fitted to various PPE models, (3) screened for pre-existing dermatoses prior to deployment and (4) educated on mitigation strategies/avenues for help should they encounter PROD.

Ho et al. 2022.

JAAD International, vol. 8.

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Keywords: COVID-19; contact dermatitis; occupational dermatoses; personal protective equipment; protective clothing; SARS-Cov-2.

Evidence Level: 4B

Link: [https://linkinghub.elsevier.com/retrieve/pii/S2666-3287\(22\)00042-6](https://linkinghub.elsevier.com/retrieve/pii/S2666-3287(22)00042-6)

Teleworking from home experiences during the COVID-19 pandemic among public health workers (TelEx COVID-19 study)

Background: When working from home (WFH) became temporarily necessary for staff as a result of the COVID-19 pandemic in 2020, it had to be implemented without significant organisational experience or understanding of WFH and its complexities. This study aims to determine the impacts experienced by staff who have undertaken WFH during the COVID-19 pandemic. **Methods:** This was an observational cross-sectional study using survey with a purposive sampling strategy for staff from corporate and non-clinical departments. These staff undertook WFH during COVID-19 pandemic in 2020. None of these staff had any direct operational roles in a hospital facility and clinical service. Participants' self-reports of their mood while working in their normal workplace and while WFH were collected via the Scale of Positive and Negative Experience (SPANE), a validated affect balance questionnaire. The responses from the open-ended question were analysed using thematic analysis approach. **Results:** A total of 143 participants completed the survey responses. Majority (61%) WFH for four or more months as a result of the COVID-19 pandemic. Participants rated their skills very highly on the technologies with an average rating of 9 (out of 10) for computer skills, smartphones and videoconferencing/teleconferencing applications. Participants felt WFH was an improvement on normal working, in particular in relation to their ability to concentrate and be productive. The "SPANE" relating to affect balance while WFH was completed by 124 participants (85.7%), resulting in a mean score of 5.45 (S.D. 2.98). The SPANE relating to normal working conditions was completed by 127 participant (88.8%) resulting in a mean score of 2.70 (S.D 3.69). This indicated that while participants' positive emotions typically predominated in both situations, they felt slightly more positive on average with WFH. Over 90% participants reported that they would take the opportunity to WFH again if it were offered. Data obtained from the open-ended questions had complimented the findings of the structure close-ended questions in the benefits of remote working and support for their health and wellbeing. The open-ended questions had provided additional information on challenges which the participants encountered during the WFH experience and their suggested preference to sustain this workplace practice. **Conclusions:** This study highlighted factors that impacted workers' work processes, productivity, physical and mental health well-being while WFH and provided a foundation for considering how to best support a positive WFH experience.

Chow et al. 2022.

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

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Keywords: COVID-19; health workers; teleworking; work from home; WFH.

Evidence Level: 4A

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-022-13031-0>

Working from home in Australia during the COVID-19 pandemic: Cross-sectional results from the Employees Working From Home (EWFH) study

Background: To investigate the impacts, on mental and physical health, of a mandatory shift to working from home during the COVID-19 pandemic. **Methods:** Cross sectional, online survey. Setting: Online survey was conducted from September 2020 to November 2020 in the general population. Participants: Australian residents working from home for at least 2 days a week at some time in 2020 during the COVID-19 pandemic. Main outcome measures: Demographics, caring responsibilities, working from home arrangements, work-related technology, work-family interface, psychosocial and physical working conditions, and reported stress and musculoskeletal pain. **Results:** 924 Australians responded to the online questionnaire. Respondents were mostly women (75.5%) based in Victoria (83.7%) and employed in the education and training and healthcare sectors. Approximately 70% of respondents worked five or more days from home, with only 60% having a dedicated workstation in an uninterrupted space. Over 70% of all respondents reported experiencing musculoskeletal pain or discomfort. Gendered differences were observed; men reported higher levels of family to work conflict (3.16 ± 1.52 to 2.94 ± 1.59 , $p=0.031$), and lower levels of recognition for their work (3.75 ± 1.03 to 3.96 ± 1.06 , $p=0.004$), compared with women. For women, stress (2.94 ± 0.92 to 2.66 ± 0.88 , $p<0.001$) and neck/shoulder pain (4.50 ± 2.90 to 3.51 ± 2.84 , $p<0.001$) were higher than men and they also reported more concerns about their job security than men (3.01 ± 1.33 to 2.78 ± 1.40 , $p=0.043$). **Conclusions:** Preliminary evidence from the current study suggests that working

from home may impact employees' physical and mental health, and that this impact is likely to be gendered. Although further analysis is required, these data provide insights into further research opportunities needed to assist employers in optimising working from home conditions and reduce the potential negative physical and mental health impacts on their employees.

Oakman et al. 2022.

BMJ Open, vol. 12, no. 4.

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Keywords: COVID-19; mental health; risk management.

Evidence Level: 4A

Link: <https://bmjopen.bmj.com/content/12/4/e052733.long>

Workplace contact patterns in England during the COVID-19 pandemic: Analysis of the Virus Watch prospective cohort study

Background: Workplaces are an important potential source of SARS-CoV-2 exposure; however, investigation into workplace contact patterns is lacking. This study aimed to investigate how workplace attendance and features of contact varied between occupations across the COVID-19 pandemic in England.

Methods: Data were obtained from electronic contact diaries (November 2020–November 2021) submitted by employed/self-employed prospective cohort study participants ($n=4,616$). We used mixed models to investigate the effects of occupation and time for: workplace attendance, number of people sharing workspace, time spent sharing workspace, number of close contacts, and usage of face coverings.

Results: Workplace attendance and contact patterns varied across occupations and time. The predicted probability of intense space sharing during the day was highest for healthcare (78% [95% CI: 75–81%]) and education workers (64% [59%–69%]), who also had the highest probabilities for larger numbers of close contacts (36% [32%–40%] and 38% [33%–43%] respectively). Education workers also demonstrated relatively low predicted probability (51% [44%–57%]) of wearing a face covering during close contact.

Across all occupational groups, workspace sharing and close contact increased and usage of face coverings decreased during phases of less stringent restrictions. **Conclusion:** Major variations in workplace contact patterns and mask use likely contribute to differential COVID-19 risk. Patterns of variation by occupation and restriction phase may inform interventions for future waves of COVID-19 or other respiratory epidemics. Across occupations, increasing workplace contact and reduced face covering usage is concerning given ongoing high levels of community transmission and emergence of variants.

Funding: Medical Research Council; HM Government; Wellcome Trust.

Beale et al. 2022.

The Lancet Regional Health Europe, vol 16.

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Keywords: COVID-19; epidemiology; occupation; public health.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S266677622200045X?via%3Dihub>

Couriers' safety and health risks before and during the COVID-19 pandemic

Background: This study aimed to examine the safety and health hazards of motorized couriers and investigate working conditions and driving behavior possibly associated with involvement in road accidents while driving motorcycles or cars. In light of the outbreak of COVID-19, the study was aimed to explore factors that affect the couriers' behaviors related to decreasing the risk of contracting an infectious disease.

Methods: A sample of 237 Israeli couriers, about half who drove a two-wheeled vehicles and the others who drove cars, answered an online survey questionnaire. The questionnaire examined organizational, occupational, and personal factors regarding their working conditions, behavior on the road, musculoskeletal disorders, road accidents, and perceptions of and compliance with regulations regarding COVID-19. The data were analyzed by multiple regression in SPSS 25, structural equation modeling and mediation tests in R 3.6.2. **Results:** According to the couriers' self-report, 37% reported musculoskeletal pains at least once a day, 13% of them were involved in work-related road accidents and 10% reported feeling stress at least once a week. More than 60% of the couriers reported increased stress due to the COVID-19 pandemic. Weekly working hours, shift duration and stress were related to involvement in

accidents through the mediation of driving while feeling unwell. Reported stress and the weight of parcels were related to musculoskeletal pains. **Conclusions:** The findings suggest that stress and attributes of work overloads experienced by couriers are associated with reduced safety and impaired health. Organizational, individual, and societal factors were correlated with the degree to which the couriers adhered to COVID-19 regulations. The increased prevalence of new modes of employment relationships in the field highlights the importance of research on employment conditions and safety and health aspects related to this occupation.

Egozi et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 3.

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Keywords: Accident; COVID-19; couriers; health; musculoskeletal; safety.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007/s00420-021-01795-8>

Masking by health care and public safety workers in non-patient care areas to mitigate SARS-CoV-2 infection: A systematic review

Background: Wearing a mask is an important method for reducing severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) transmission in health care and public safety settings. We assess the evidence regarding masking in the workplace during the initial months of the COVID-19 pandemic (PROSPERO CRD4202432097). **Methods:** We performed a systematic review of published literature from 4 databases and evaluated the quality of evidence with the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) framework. We searched for observational and experimental research involving public safety and health care workers. We included articles evaluating the use of masks, versus no mask, on the outcome of SARS-CoV-2 infection. **Results:** Our search yielded 15,013 records, of which 9 studies were included. Most studies (n = 8; 88.9%) involved infections or outbreaks among health care workers. The majority (88.9%) used in-depth interviews of cases and non-cases to obtain self-reported use of masks during periods of exposure. One of 9 studies quantitatively assessed differences in SARS-CoV-2 infection based on use of masks in non-patient care settings. Use of observational study designs, small sample sizes, inadequate control for confounding, and inadequate measurement of exposure and non-exposure periods with infected coworkers contributed to the quality of evidence being judged as very low. **Conclusions:** The available evidence from the initial months of the pandemic suggests that the use of masks in congregate, non-patient care settings, such as breakrooms, helps to reduce risk of SARS-CoV-2 virus transmission. However, this evidence is limited and is of very low quality. Prospective studies incorporating active observation measures are warranted.

Patterson et al. 2022.

Journal of the American College of Emergency Physicians Open, vol. 3, no. 2.

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Keywords: COVID; SARS-CoV-2; health care; masks; public safety.

Evidence Level: 1A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8957376/>

Indoor green wall affects health-associated commensal skin microbiota and enhances immune regulation: A randomized trial among urban office workers

Background: Urbanization reduces microbiological abundance and diversity, which has been associated with immune mediated diseases. Urban greening may be used as a prophylactic method to restore microbiological diversity in cities and among urbanites. This study evaluated the impact of air-circulating green walls on bacterial abundance and diversity on human skin, and on immune responses determined by blood cytokine measurements. **Methods:** Human subjects working in offices in two Finnish cities (Lahti and Tampere) participated in a two-week intervention, where green walls were installed in the rooms of the experimental group. Control group worked without green walls. Skin and blood samples were collected before (Day0), during (Day14) and two weeks after (Day28) the intervention. **Results:** The relative abundance of genus *Lactobacillus* and the Shannon diversity of phylum Proteobacteria and class

Gammaproteobacteria increased in the experimental group. Proteobacterial diversity was connected to the lower proinflammatory cytokine IL-17A level among participants in Lahti. In addition, the change in TGF- β 1 levels was opposite between the experimental and control group. As skin Lactobacillus and the diversity of Proteobacteria and Gammaproteobacteria are considered advantageous for skin health, air-circulating green walls may induce beneficial changes in a human microbiome. The immunomodulatory potential of air-circulating green walls deserves further research attention.

Soininen et al. 2022.

Scientific Reports, vol. 12, no. 1.

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Keywords: Microbiology; urbanization; immune regulation; microbiota; office workers.

Evidence Level: 2B

Link: <https://www.nature.com/articles/s41598-022-10432-4>

Risk Assessment

Risk factors for COVID-19 infection among healthcare workers. A first report from a living systematic review and meta-analysis

Background: Health care workers (HCWs) are more than ten times more likely to be infected with COVID-19 compared to the general population, thus demonstrating the burden of COVID-19 among HCWs. Factors that expose HCWs to a differentially high-risk of COVID-19 acquisition are important to elucidate, to enable appropriate public health interventions to mitigate against high risk and reduce adverse outcomes from the infection. **Methods:** We conducted a systematic review and meta analysis to summarise and critically analyse the existing evidence on SARS-CoV-2 risk factors among HCWs. With no geographical limitation, we included studies, in any country, that reported (i) PCR laboratory diagnosis of COVID-19 as an independent variable (ii) one or more COVID-19 risk factors among health care workers with risk estimates (relative risk, odds ratio or hazard ratio) (iii) original, quantitative study design and published in English or Mandarin.

Results: Our initial search resulted in 470 articles overall, however, only 10 studies met the inclusion criteria for this review. Out of the 10 studies included in the review, inadequate/lack of protective personal equipment (PPE), performing tracheal intubation (PTI) and gender were the most common risk factors of COVID-19. Based on the random effects adjusted pooled relative risk, HCWs who reported use PPE were 29% (95% CI: 16% to 41%) less likely to test positive for COVID-19. The study also revealed that HCWs who performed tracheal intubations were 34% (95% CI: 14% to 57%) more likely to test positive for COVID-19. Interestingly, this study showed that female HCWs are at 11% higher risk (RR 1.11 95% CI 1.01-1.21) of COVID-19 than their male counterparts. **Conclusion:** This paper presents initial findings from a living systematic review and meta-analysis, therefore, did not yield many studies, however, it revealed a significant insight to better understand COVID-19 risk factors among HCWs; insights important for devising preventive strategies that protect them from this infection.

Dzinamarira et al. 2022.

Safety and Health at Work, vol. 12.

User License:

Keywords: COVID-19; healthcare worker; SARS-CoV-2; risk factor; systematic review.

Evidence Level: 1A

Link: <https://www.sciencedirect.com/science/article/pii/S2093791122000531?via%3Dihub>

Chronic Health Issues

This month we explore the chronic health issues associated with pregnancy-related hypertension and diabetes, cancer diagnosis and systemic autoimmune diseases.

Occupational stress and pregnancy-related hypertension and diabetes: Results from a nationwide prospective cohort

Background: Using a large, national, prospective cohort, while adjusting for other work exposures, this study aims to investigate whether exposure to occupational stress during pregnancy is associated with hypertensive disorders of pregnancy (HDP) and gestational diabetes. **Methods:** Our cohort consisted of 1 02 230 singleton births between 1994-2014 in Sweden, based on high-quality register data of Swedish pregnancies. Exposure to occupational stress was obtained from a job exposure matrix (JEM) constructed from 12 questions pertaining to the psychosocial work environment from the 1997-2013 cycles of Swedish Work Environment Survey, including approximately 75 000 individuals. We utilized the decision authority, demands, and social support indices. Decision authority and demands were combined to categorize occupations into low, active, passive, and high strain work. We estimated relative risks (RR) and adjusted for relevant confounders, such as age, smoking and other work exposures. **Results:** Occupations with lower levels of decision authority were associated with increased risks of 12-23% for HDP and preeclampsia and 36-58% for gestational diabetes compared to occupations with the highest levels of decision authority. Passive occupations had increased risks of 10% for HDP and preeclampsia and 15% for gestational diabetes when compared to low strain jobs. No significant associations were found for high strain occupations. **Conclusions:** As a whole, occupational stress was not consistently associated with pregnancy outcomes in our study. However, decision authority was associated with an increased risk for pregnancy-related complications. Further studies should investigate whether improvements in working conditions can help decrease these risks.

Lissåker et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 48, no. 3.

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Keywords: Occupational stress; pregnancy; hypertension; diabetes.

Evidence Level: 4B

Link: <https://www.sjweh.fi/article/4004>

Workforce participation in relation to cancer diagnosis, type and stage: Australian population-based study of 163,556 middle-aged people

Background: To quantify the relationship of cancer diagnosis to workforce participation in Australia, according to cancer type, clinical features and personal characteristics. **Methods:** Questionnaire data (2006-2009) from participants aged 45-64 years (n=163,556) from the population-based 45 and Up Study (n=267,153) in New South Wales, Australia, were linked to cancer registrations to ascertain cancer diagnoses up to enrolment. Modified Poisson regression estimated age- and sex-adjusted prevalence ratios (PRs) for non-participation in the paid workforce-in participants with cancer (n=8,333) versus without (n=155,223), for 13 cancer types. **Results:** Overall, 42% of cancer survivors and 29% of people without cancer were out of the workforce (PR=1.18; 95%CI=1.15-1.21). Workforce non-participation varied substantively by cancer type, being greatest for multiple myeloma (1.83; 1.53-2.18), oesophageal (1.70; 1.13-2.58) and lung cancer (1.68; 1.45-1.93) and moderate for colorectal (1.23; 1.15-1.33), breast (1.11; 1.06-1.16) and prostate cancer (1.06; 0.99-1.13). Long-term survivors, 5 or more years post-diagnosis, had 12% (7-16%) greater non-participation than people without cancer, and non-participation was greater with recent diagnosis, treatment or advanced stage. Physical disability contributed substantively to reduced workforce participation, regardless of cancer diagnosis. **Conclusions:** Cancer survivors aged 45-64 continue to participate in the workforce. However, participation is lower than in people without cancer, varying by cancer type, and is reduced particularly around the time of diagnosis and treatment and with advanced disease.

Implications for cancer survivors: While many cancer survivors continue with paid work, participation is reduced. Workforce retention support should be tailored to survivor preferences, cancer type and cancer journey stage.

Thandrayen et al. 2022.

Journal of Cancer Survivors, vol. 16, no. 2.

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Keywords: Cancer diagnosis; cancer type; clinical characteristics; cohort studies; workforce participation.

Evidence Level: 4A

Link: <https://link.springer.com/article/10.1007/s11764-021-01041-7>

Involuntariness of job changes is related to less satisfaction with occupational development in long-term breast cancer survivors

Purpose: Considering that breast cancer survivors (BCSs) have been dealing with unwanted job changes after diagnosis, this study aimed to investigate involuntary job changes (unwanted modifications in employment since diagnosis) and explore the association between job changes, involuntariness, and occupational development satisfaction in BCSs 5-6 years after diagnosis. **Methods:** Data were drawn from the mixed-methods breast cancer patients' return to work (B-CARE) study. We surveyed 184 female BCSs who were working at the time of study enrollment during hospitalization (T1), 10 weeks after discharge (T2), 40 weeks after discharge (T3), and 5-6 years after diagnosis (T4) and used descriptive measures and stepwise linear regression models for data analysis. **Results:** The mean age of BCSs was 57 years. A total of 105 participants reported 410 job changes, of which 16.1% were reportedly (rather) involuntary. The most commonly reported involuntary changes were increased workload (15.2%) and increased scope of work (15.2%). In the final model, significant predictors of satisfaction with occupational development 5-6 years after diagnosis were age, state of health Δ T2-T3, state of health Δ T3-T4, and involuntariness of job changes. **Conclusions:** Although the number of job changes alone is not substantially associated with BCSs' satisfaction with occupational development, experiencing involuntary job changes is. Sociodemographic, disease-related, and work(place)-related factors may influence occupational satisfaction among BCSs. **Implications for cancer survivors:** The findings indicate the importance of strengthening one's ability to work as desired to prevent involuntary job changes and enable desired work participation in long-term support. The significance of workplace characteristics highlights the need for employers to encourage satisfying work participation. **Trial registration number:** German Clinical Trials Register (DRKS00016982), 12 April 2019.

Hiltrop et al. 2022.

Journal of Cancer Survivors, vol. 16, no. 2.

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Keywords: Breast cancer; involuntariness; job changes; occupational development; return to work; social capital.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007/s11764-021-01035-5>

Systemic autoimmune diseases and work outcomes in Brazil: A scoping review

Background: To review articles that assessed work-related outcomes such as workability, work productivity, presenteeism, absenteeism, sick leave, return to work, and employment status of Brazilian patients with rheumatoid arthritis, systemic lupus erythematosus, systemic sclerosis, Sjögren's syndrome, and systemic autoimmune myopathies. **Methods:** This study was conducted in Medline databases (PubMed), SciELO, and Lilacs through a combination of descriptors of interest. Studies published until December 2020 were considered in the search strategy. **Results:** Eight out of 90 articles met the eligibility criteria and were included in this review. The studies are highly heterogeneous. Most of them are cross-sectional, and all of them address rheumatoid arthritis or systemic lupus erythematosus. A common denominator among these studies is the high proportion of patients outside the labor market.

Conclusions: In general, the studies show unfavorable labor outcomes and impaired participation in the Brazilian workforce among the samples of patients assessed. There is a need to better understand several topics about Brazilian patients with systemic autoimmune diseases and their work context, as well as to conduct studies focusing on rarer diseases and on the themes of return and reintegration to work.

Cordeiro et al. 2022.

Revista de Saude Publica, vol 22.

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Keywords: Autoimmune disease; Brazil; work outcomes.

Evidence Level: 6B

Link: <https://www.scielo.br/j/rsp/a/7cTtD4zKkzrtLC9sXXgfssd/?lang=en>

Occupational Exposure

This month we explore occupational exposures related to maternal occupational exposures and foetal growth, cancer incidence in firefighters, urinary nickel, genotoxic drugs in healthcare, dust-control measures in construction workers, PM(2.5), formaldehyde, allergens and endotoxins, asbestos, cleaning products, air pollution, aluminium, free crystalline silica, ionising radiation, and occupational noise

Maternal occupational exposures and foetal growth in a Spanish birth cohort

Background: While the epidemiologic literature suggests certain maternal occupational exposures may be associated with reduced measures of size at birth, the occupational literature employing foetal biometry data to assess foetal growth is sparse. **Methods:** The present study examines associations between maternal occupational exposures and ultrasound-measured foetal growth. We included 1,739 singleton pregnancies from the Infancia y Medio Ambiente (INMA) project (2003-2008). At 32 weeks of pregnancy, interviewers ascertained mothers' employment status and assessed job-related physical loads, work schedules, and job strain during pregnancy. Job titles were linked to a job-exposure matrix to estimate exposure to 10 endocrine disrupting chemical (EDC) groups. We calculated z-scores from longitudinal growth curves representing trajectories from 0-12, 12-20 and 20-34 gestational weeks for abdominal circumference (AC), biparietal diameter (BPD), femur length (FL), and estimated foetal weight (EFW). Linear mixed models clustered by IMNA region (i.e., Gipuzkoa, Sabadell, Valencia) were used to examine associations between occupational exposures and foetal growth. Effect estimates are presented as percentage change in foetal growth. **Results:** There was limited evidence of associations between work-related non-chemical stressors and foetal growth. We observed associations of similar magnitude between multiple EDC groups and decreased EFW trajectories during 20-34 gestational weeks (phthalates: -1.4% [-3.5, 0.6%]; alkyl phenolic compounds (APCs): -1.1% [-2.3, 0.1%]; miscellaneous chemicals: -1.5% [-3.7, 0.8%]), while miscellaneous chemicals were associated with increased BPD from 12-20 weeks (2.1% [0.8, 3.5%]). Notably, 67% of women exposed to phthalates were hairdressers; 68% of women exposed to APCs worked as domestic cleaners. In conclusion, we found limited evidence that maternal occupational exposures impact fetal growth. Further research should consider the combined impact of multiple workplace exposures.

Ish et al. 2022.

PLoS One, vol. 17, no. 4.

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Keywords: Fetal growth; maternal occupational exposures; Spain.

Evidence Level: 4B

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0264530>

Cancer incidence in sites potentially related to occupational exposures: 58 years of follow-up of firefighters in the Norwegian Fire Departments Cohort

Background: Firefighters are exposed to a variety of known and suspected carcinogens through their work. However, the association with cancer risk has limited evidence. We examined cancer incidence among firefighters in the newly established Norwegian Fire Departments Cohort restricted to sites with established associations with carcinogens encountered during firefighting. This included sites within the respiratory, urinary, and lympho-hematopoietic systems, and the skin and all sites combined. **Methods:** Male firefighters (N=3881) in the cohort were linked to the Cancer Registry of Norway for incident cancer cases occurring during the period 1960-2018. We calculated standardized incidence ratios (SIR) with rates for the national male population as reference, and stratified SIR analyses by period of first employment, duration of employment, and time since first employment. **Results:** Elevated risk was seen for all sites combined (SIR 1.15, 95% confidence interval 1.07-1.23). Elevated risk of urinary tract cancer was observed among firefighters who began working before 1950, and with observation ≥ 40 years since first employment. Risk of mesothelioma and laryngeal cancer were elevated with ≥ 40 years since first employment and with ≥ 30 years employment duration. **Conclusions:** The observed associations between firefighting and urinary tract cancer, laryngeal cancer, and mesothelioma have been observed in some studies previously, and our

results suggest the observed elevated risks are related to carcinogenic occupational exposures. Differences in risk by period of employment potentially reflect changes in exposures from improved quality and use of personal protective equipment.

Marjerrison et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 48, no. 3.

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Keywords: Occupational exposure; carcinogens; cancer risk; cancer; fire department.

Evidence Level: 4B

Link: <https://www.sjweh.fi/article/4009>

Biomonitoring of urinary nickel successfully protects employees and introduces effective interventions

Background: Nickel is a heavy metal used in many industries. Nickel exposure can induce respiratory diseases and allergic reactions, and increase cancer risk. This study evaluated the introduction of a grinding and polishing system to prevent injuries from nickel toxicity in workers. **Methods:** We performed a controlled, interventional, before-and-after study from January 2018 to December 2019 at a faucet component industrial manufacturing site. Results from workplace environmental monitoring, questionnaire responses, and biomonitoring were collected before and after the intervention. **Results:** Thirty-seven workers (100% men) aged 25.0 (interquartile range (IQR): 22.0-33.5) years were categorized into two groups, those with and without nickel exposure. In the exposed group, the median exposure time was 18.0 months (IQR 14.0-20.0 months). Urinary nickel concentration was lower in the exposed group than in the non-exposed group (13.8 (IQR 1.7-20.7); 23.1 (IQR 11.3-32.8) µg/g creatinine, respectively; $p = 0.047$). The median urinary nickel concentration was lower in the second year than in the first year (17.4 (IQR 2.2-27.4), 7.7 (IQR 4.3-18.5) µg/g creatinine, respectively; $p = 0.022$). **Conclusion:** Significant reductions in urinary nickel concentration were observed following the intervention and educational program. Thus, biomonitoring of urinary nickel concentration can successfully reflect the effectiveness of interventions and their relationship to nickel exposure.

Kuo et al. 2022.

International Journal of Environmental Research and Public Health, vol. 19, no. 18.

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Keywords: Behavioral change; biomonitoring; nickel toxicity; urinary nickel; workplace monitoring.

Evidence Level: 3A

Link: <https://www.mdpi.com/1660-4601/19/8/4887>

Respiratory symptoms and use of dust-control measures in New Zealand construction workers - A cross-sectional study

Background: Dust-exposed construction workers have an increased risk of respiratory symptoms, but the efficacy of dust-control measures remains unclear. **Methods:** This study compared respiratory symptoms, using a modified European Community Respiratory Health Survey questionnaire, between construction workers ($n = 208$) and a reference group of bus drivers and retail workers ($n = 142$). Within the construction workers, we assessed the effect of collective (on-tool vacuum/'wet-cut' systems) and personal (respirators) exposure controls on symptom prevalence. Logistic regression assessed differences between groups, adjusted for age, ethnicity, and smoking status. **Results:** Construction workers were more likely to cough with phlegm at least once a week (OR 2.4, 95% CI 1.2-4.7) and cough with phlegm ≥ 3 months/year for ≥ 2 years (OR 2.8, CI 1.2-7.0), but they had similar or fewer asthma symptoms. Construction workers who had worked for 11-20 years reported more cough/phlegm symptoms (OR 5.1, 1.7-15.0 for cough with phlegm ≥ 3 months/year for ≥ 2 years) than those who had worked < 10 years (OR 1.9, 0.6-5.8), when compared to the reference group. Those who used 'wet-cut' methods reported less cough with phlegm, although the evidence for this association was weak (OR 0.4, CI 0.2-1.1 for cough with phlegm at least once a week); use of on-tool extraction showed a similar trend. No associations between respiratory protective equipment-use and symptoms were found. **In conclusion,** construction workers reported more symptoms suggestive of bronchitis, particularly those employed in the industry for > 10 years. Use of collective dust exposure controls might protect against these symptoms, but this requires confirmation in a larger study.

Keer et al. 2022.

PLoS One, vol. 17, no. 4.

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Keywords: Respiratory; dust-control; construction.

Evidence Level: 4A

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0266668>

The exposure of workers at a busy road node to PM(2.5): Occupational risk characterisation and mitigation measures

Background: The link between air pollution and health burden in urban areas has been well researched. This has led to a plethora of effective policy-induced monitoring and interventions in the global south. However, the implication of pollutant species like PM_{2.5} in low middle-income countries (LMIC) still remains a concern. By adopting a positivist philosophy and deductive reasoning, this research addresses the question, to what extent can we deliver effective interventions to improve air quality at a building structure located at a busy road node in a LMIC? **Methods:** This study assessed the temporal variability of pollutants around the university environment to provide a novel comparative evaluation of occupational shift patterns and the use of facemasks as risk control interventions. **Results:** The findings indicate that the concentration of PM_{2.5}, which can be as high as 300% compared to the WHO reference, was exacerbated by episodic events. With a notable decay period of approximately one-week, adequate protection and/or avoidance of hotspots are required for at-risk individuals within a busy road node. The use of masks with 80% efficiency provides sufficient mitigation against exposure risks to elevated PM_{2.5} concentrations without occupational shift, and 50% efficiency with at least '2 h ON, 2 h OFF' occupational shift scenario. **Ejohwomu et al. 2022.**

International Journal of Environmental Research and Public Health, vol. 19, no. 18.

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Keywords: Control intervention; elevated PM_{2.5} concentration; episodic event; low and middle income countries (LMIC); occupational exposure; reference concentration; risk characterisation.

Evidence Level: 6B

Link: <https://www.mdpi.com/1660-4601/19/8/4636>

A simple approach to assess the cancer risk of occupational exposure to genotoxic drugs in healthcare settings

Background: Several drugs for human use possess genotoxic properties as a necessary consequence of their intended therapeutic effect (e.g. antineoplastics). Health workers may be exposed to these chemicals in various occupational settings such as dose preparation and administration. To date, there are no quantitative risk assessment models to estimate the cancer risk of health workers due to the handling of genotoxic drugs. We therefore developed a quantitative risk assessment model to assess the cancer risk of occupational exposure to genotoxic drugs in healthcare settings based on the threshold of toxicological concern (TTC) concept. This model was used to evaluate the cancer risk of health workers due to the handling of genotoxic drugs in modern health care facilities. **Methods:** We modified the threshold of toxicological concern (TTC) concept to fit the purpose of occupational cancer risk assessment. The risk model underlying ICH guideline M7 (R1): "assessment and control of DNA reactive (mutagenic) impurities in pharmaceuticals to limit potential carcinogenic risk" was used as a starting point for our model. We conducted a short review of studies on the occupational exposure of health workers to genotoxic drugs. These occupational exposure data were compared to the acceptable exposure levels resulting from our TTC based risk model. **Results:** Based on the threshold of toxicological concern (TTC) concept, we defined an acceptable daily intake (ADI) of 4 µg/day as threshold of no concern for the exposure of health workers to genotoxic drugs. Regarding the dermal exposure of health workers to genotoxic drugs, we derived a corresponding acceptable surface contamination level (ASCL) of 20 ng/cm². Both ADI and ASCL are usually not exceeded in modern healthcare settings. Current safety precautions provide sufficient protection to health workers. **Conclusions:** The application of our model indicates that workers in modern healthcare facilities are not at risk of developing work related cancer above widely accepted cancer risk levels due to the occupational exposure to genotoxic drugs. Hence, the present study may assist employers and public

authorities to make informed decisions concerning the need for (further) protective measures and during risk communication to health workers.

Gerding et al. 2022.

Journal of Occupational and Medical Toxicology, vol. 17, no. 1.

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Keywords: Cancer; genotoxic drugs; health workers; occupational exposure; risk assessment; threshold of toxicological concern.

Evidence Level: 6B

Link: <https://occup-med.biomedcentral.com/articles/10.1186/s12995-022-00349-z>

The formation of SCEs as an effect of occupational exposure to formaldehyde

Background: Formaldehyde (FA) is a ubiquitous toxic chemical employed worldwide due to its disinfectant and preservative properties. Despite being classified as a human carcinogen, FA is still employed as formalin in pathology wards as standard fixative. **Methods:** We evaluated its relationship with the formation of sister-chromatid exchanges (SCEs) in cultured peripheral blood lymphocytes on 57 pathologists and 48 controls and the risk/protective role played by several genetic polymorphisms. All subjects were assessed for SCEs and genotyped for the most common cancer-associated gene polymorphisms: CYP1A1 exon 7 (A > G), CYP1A1*2A (T > C), CYP2C19*2 (G > A), GSTT1 (presence/absence), GSTM1 (presence/absence), GSTP1 (A > G), XRCC1 (G399A), XRCC1 (C194T), XRCC1 (A280G), XPC exon 15 (A939C), XPC exon 9 (C499T), TNF α - 308 G > A), IL10 - 1082 (G > A), and IL6 - 174 (G > C). Air-FA concentration was assessed through passive personal samplers. **Results:** Pathologists, exposed to 55.2 $\mu\text{g}/\text{m}^3$ of air-FA, showed a significantly higher SCEs frequency than controls, exposed, respectively, to 18.4 $\mu\text{g}/\text{m}^3$. Air-FA was directly correlated with SCEs frequency and inversely with the replication index (RI). Regression models showed FA exposure as a significant predictor in developing SCEs, while did not highlight any role of the selected polymorphisms. **Conclusion:** Our study confirms the role of low air-FA levels as genotoxicity inductor, highlighting the importance to define exposure limits that could be safer for exposed workers.

Ghelli et al. 2022.

Archives of Toxicology, vol. 96, no. 4.

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Keywords: Biomonitoring; formaldehyde; genotoxicity; occupational exposure.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007/s00204-022-03238-w>

Comparing the concentration levels of allergens and endotoxins in employees' homes and offices

Background: The aim of the study was to find out whether allergen and endotoxin concentrations in offices differ from those measured at the homes of employees, and identify the parameters that influence exposure. **Methods:** Electrostatic dust collectors (EDCs) were placed in five office buildings (68 rooms, 436 EDCs), as well as the homes of the office workers (145 rooms, 405 EDCs) for 14 days, four times a year. In addition, surface samples were collected from the offices four times a year by vacuuming the carpeted floors. Domestic mite (DM), and the major cat and dog allergens (Fel d 1 and Can f 1) were quantified in all samples using fluorescence enzyme immunoassays. Endotoxin was measured in the EDC samples, using the Limulus amoebocyte lysate assay. The allergen and endotoxin concentrations were log transformed and analysed with multilevel models. **Results:** Endotoxin concentrations were significantly higher in personal homes compared to levels measured in the offices, and depended on the number of persons living in each household, as well as the presence of a dog. DM allergens were significantly higher in households than in offices, and were significantly higher in bedrooms compared to living rooms. Offices occupied by cat owners had significantly higher Fel d 1 concentrations than offices or homes without. Additionally, Can f 1 concentrations were significantly higher in offices occupied by dog owners compared to those without. **Conclusions:** Pet owners appear to transfer cat and dog allergens to their offices. Therefore, in case of allergy complaints at the office, employers and physicians might consider possible contamination by cat and dog allergens.

Sander et al. 2022.

International Archives of Occupational and Environmental Health, vol. 95, no. 3.

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Keywords: Cat allergen Fel d 1; Dog allergen Can f 1; domestic mite allergens; electrostatic dust collectors; endotoxin.

Evidence Level: 5A

Link: <https://link.springer.com/article/10.1007/s00420-021-01794-9>

Head and neck cancer and asbestos exposure

Background: The aim of this study was to analyse, within a French cohort of workers previously occupationally exposed to asbestos, incidence and mortality from various sites of head and neck cancers (larynx excluded) and to examine the potential link of these cancers with pleural plaques. **Methods:** A 10-year follow-up study was conducted in the 13 481 male subjects included in the cohort between October 2003 and December 2005. Asbestos exposure was assessed by industrial hygienist analysis of a standardised questionnaire. The final cumulative exposure index (CEI; in equivalent fibres.years/mL) for each subject was calculated as the sum of each employment period's four-level CEI. The number of head and neck cancers recorded by the National Health Insurance fund was collected in order to conduct an incidence study. Complementary analysis was restricted to men who had performed at least one chest CT scan (N=4804). A mortality study was also conducted. We used a Cox model with age as the time axis variable adjusted for smoking, time since first exposure, CEI of exposure to asbestos and pleural plaques on CT scans. **Results:** We reported a significant dose-response relationship between CEI of exposure to asbestos and head and neck cancers after exclusion of laryngeal cancers, in the mortality study (HR 1.03, 95% CI (1.01 to 1.06) for an increase of 10 f.years/mL) and a close to significant dose-response relationship in the incidence study (HR 1.02, 95% CI (1.00 to 1.04) for an increase of 10 f.years/mL). No statistically significant association between pleural plaques and head and neck cancer incidence was observed. **Conclusions:** This large-scale study suggests a relationship between asbestos exposure and head and neck cancers, after exclusion of laryngeal cancers, regardless of whether associated pleural plaques were present.

Clin et al. 2022.

Occupational and Environmental Medicine, vol. 7.

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Keywords: Asbestos; cancer; occupational health; otorhinolaryngologic diseases.

Evidence Level: 4B

Link: <https://oem.bmj.com/content/early/2022/04/06/oemed-2021-108047.long>

Identifying cleaning products associated with short-term work-related respiratory symptoms: A workforce-based study in domestic cleaners

Background: Domestic cleaners have an increased risk of asthma-like and other respiratory symptoms and conditions. Uncertainty exists about which products are most hazardous. We aimed to investigate, among professional domestic cleaners, the associations of ocular/respiratory outcomes with using specific types of products at work and with the ability to choose their own products. **Methods:** Among domestic cleaners employed by "service vouchers" companies in Belgium, we administered an online questionnaire on ocular/respiratory symptoms (frequency and time relation to workdays), frequency of use of 40 types of products, and ability to choose one's own products. Work-relatedness was defined as symptoms improving/disappearing on days off-work. We studied associations between frequency of product-use with work-related outcomes (eye irritation, rhinitis symptoms, sore throat, laryngeal symptoms, asthma symptoms, cough) and with chronic bronchitis, using multivariable logistic and elastic net regression. Adjusted odds ratios (OR) with 95%-confidence intervals were obtained per time a product was used per week. **Results:** Among 1,586 domestic cleaners (99% women), the number of times sprays were used (median 13/week) was significantly associated with all outcomes (ORs between 1.012 and 1.024 per time sprays were used per week). Bleach/disinfectant-containing liquid products were associated with all outcomes, except for laryngeal symptoms (ORs 1.086 to 1.150); ammonia with work-related upper airway symptoms and chronic bronchitis. Cleaners able to choose their own products had fewer work-related eye

symptoms (OR 0.728;0.556-0.954), rhinitis (OR 0.735;0.571-0.946) and cough (OR 0.671;0.520-0.865). Using elastic net regression, work-related rhinitis was most strongly associated with mould removal spray (OR 1.108;1.006-1.248), carpet/seat/curtain spray (OR 1.099;1.001-1.304) and ammonia (OR 1.081;1.002-1.372); work-related asthma with carpet/seat/curtain spray (OR 1.103;1.017-1.322), mould removal spray (OR 1.029;0.995-1.199) and drain cleaner (OR 1.023;0.979-1.302). **Conclusion:** In a large group of domestic cleaners, we documented that cleaning products have a range of adverse respiratory effects. Empowering cleaners to choose their products may reduce the burden of symptoms.

De Troeyer et al. 2022.

Environment International, vol. 162.

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Keywords: Cleaning products; empowerment; occupational exposures; service vouchers; work-related asthma; work-related rhinitis.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0160412022000964?via%3Dihub>

Short-term exposure to ambient air pollution and onset of work incapacity related to mental health conditions

Background: The OECD estimates that greater work absenteeism is one of the main drivers behind the impact of air pollution on gross domestic product loss, but research linking air pollution with work absenteeism is scarce. With air pollution increasingly being linked to poor mental health, and poor mental health having become one of the main reasons for work absenteeism, we examined whether the onset of work incapacity related to mental health conditions is associated with short-term fluctuations in ambient black carbon (BC), nitrogen dioxide (NO₂), ozone (O₃), and particulate matter 2.5 (PM_{2.5}), estimating the contributions of these pollutants jointly, while accounting for relative humidity, total solar radiation and temperature. **Methods:** We conducted a bidirectional time-stratified case-crossover study with daily air pollution estimates by municipality linked with 12 270 events of work incapacity related to mental health conditions in 2019 in Belgium. We ran single- and multi-pollutant conditional logistic regression models for three different exposure windows (lag 0, 0-1 and 0-2), considering potential confounding by relative humidity and total solar radiation. **Results:** We observed positive associations between work incapacity related to mental health conditions and BC, NO₂, and O₃ exposure, but findings for PM_{2.5} were inconsistent. Results from multi-pollutant models showed a 12% higher risk of work incapacity for an IQR increase in NO₂ and O₃ at the day of the event (lag 0), with estimates increasing to about 26% for average concentrations up to two days before the event (lag 0-2). We found evidence for effect modification by age and season in the association with NO₂, with highest effect estimates in the age group 40-49 years and in spring and summer. For O₃, we observed effect modification by type of mental health problem.

Conclusion: This country-wide study suggests that air pollution aggravates within 48 h a likely existing propensity to enter work incapacity because of mental health conditions.

Bruyneel et al. 2022.

Environment International, vol. 164.

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Keywords: Absenteeism; adults; air pollutants; case-crossover studies; mental health; occupational diseases.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0160412022001714?via%3Dihub>

Neuropsychological function among workers exposed to aluminum – A mini-review

Background: Aluminium (Al) is the most common element in nature after oxygen and silicon. Aluminium has been proposed to be a causative agent in the development of neurodegenerative diseases. Aluminium made available via the lungs, as it is in occupational settings, is probably better absorbed than that entering the body via the gastrointestinal tract. Neuropsychological tests are sensitive methods for detecting subtle functional impairment of the nervous system. **Methods:** This minireview is based on a systematic literature search for studies on workers occupationally exposed to aluminium. The tests were categorized as belonging to one of 12 different neuropsychological functions. The level of significance was set at p<0.05.

Among the 559 papers identified, 24 fulfilled the inclusion criteria. **Results:** There were no clear, consistent findings of occupational aluminium exposure being correlated with neuropsychological deficits. However, there was a weak tendency toward worse performances on tests related to information processing speed and a slight tendency toward weaker performances on memory tests for workers exposed to aluminium. **Conclusion:** The limited number of studies in this field makes it difficult to draw a clear conclusion regarding whether occupational exposure to aluminium increases the risk of altered neuropsychological function.

Bast-Pettersen 2022.

Industrial Health, vol. 60, no. 2.

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Keywords: Aluminum production; aluminum welders; memory; neuropsychological tests; speed of information processing.

Evidence Level: 6A

Link: https://www.jstage.jst.go.jp/article/indhealth/60/2/60_2021-0131/article

Systematic review and meta-analysis on the association of occupational exposure to free crystalline silica and rheumatoid arthritis

Background: Occupational exposure to free crystalline silica and tobacco smoking are associated with an increased risk rheumatoid arthritis, with the evidence of an interaction in seropositive subjects. Further studies in the field are needed to support such association **Methods:** We carried out a systematic search for all published epidemiological studies concerning the association between occupational exposure to free crystalline silica (FCS) and subsequent development of rheumatoid arthritis (RA). A meta-analysis was conducted on relevant studies. We searched PubMed and Embase, search engines, for original articles published (from 1960 to November 2019) in any language. In addition, we also searched reference lists of included studies manually for additional relevant articles. Finally, twelve studies were included in the meta-analysis (seven case-control cases and five cohort studies). The odds risks and 95% confidence interval (CI) were calculated using a random effect meta-analysis. **Results:** A primary meta-analysis (using a random effect model)-regarding RA risk in subjects exposed to FCS-yelled to an overall OR of 1.94 (95% CI 1.46-2.58). We also conducted three further meta-analysis, taking into account the presence of autoantibodies (anti-RF or anti-ACPA) and smoking habits and found a significant association between FCS and RA in both seropositive and seronegative subjects (OR 1.74, 95% CI 1.35-2.25 and OR 1.23, 95% CI 1.06-1.4, respectively) and in seropositive subjects which were smokers (OR 3.30, 95% CI 2.40-4.54). **Conclusion:** The studies that have investigated the association between RA and occupational exposure to FCS are still scarce and the heterogeneity between the studies remains high. Some critical limitations have been identified within studies, among which, the methods for assessing exposure stand out. Although with due caution, our results confirm the hypothesis of an association between occupational exposure to FCS and RA development. There was an interaction between FCS and tobacco smoking in RA seropositive workers.

Morotti et al. 2022.

Clinical Reviews in Allergy and Immunology, vol. 62, no. 2.

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Keywords: Free crystalline silica; meta-analysis; rheumatoid arthritis; silica.

Evidence Level: 1A

Link: <https://link.springer.com/article/10.1007/s12016-021-08846-5>

Association between atrial fibrillation and occupational exposure in firefighters based on self-reported survey data

Background Exposure to inhaled smoke, pollutants, volatile organic compounds, and polycyclic aromatic hydrocarbons in the firefighting environment has been associated with detrimental respiratory and cardiovascular effects, making firefighters a unique population with both personal and occupational risk factors for cardiovascular disease. Some of these exposures are also associated with development of atrial fibrillation. We aimed to study the association of atrial fibrillation and occupational exposure in firefighters. **Methods:** A cross-sectional survey was conducted between October 2018 and December 2019. Data were

gathered electronically and stored in a secure REDCap database through Louisiana State University Health Shreveport. Firefighters who were members of at least 1 of 5 preselected professional organizations were surveyed via electronic links distributed by the organizations. The survey queried the number of fires fought per year as a measure of occupational exposure, as well as self-reported cardiovascular disease.

Results: A total of 10 860 active firefighters completed the survey, of whom 93.5% were men and 95.5% were aged ≤ 60 years. Firefighters who fought a higher number of fires per year had a significantly higher prevalence of atrial fibrillation (0-5 fires per year 2%, 6-10 fires per year 2.3%, 11-20 fires per year 2.7%, 21-30 fires per year 3%, 31 or more fires per year 4.5%; $P < 0.001$). Multivariable logistic regression showed that a higher number of fires fought per year was associated with an increased risk of atrial fibrillation (odds ratio 1.14 [95% CI, 1.04-1.25]; $P = 0.006$). **Conclusions** Firefighters may have an increased risk of atrial fibrillation associated with the number of fires they fight per year. Further clinical and translational studies are needed to explore causation and mechanisms.

Vanchiere et al. 2022.

Journal of the American Heart Association, vol. 11, no. 7.

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Keywords: Atrial fibrillation; cardiovascular disease; firefighter; risk factors; smoke.

Evidence Level: 4B

Link:

https://www.ahajournals.org/doi/full/10.1161/JAHA.121.022543?rfr_dat=cr_pub++0pubmed&url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org

Telomere fragility in radiology workers occupationally exposed to low doses of ionising radiation

Background: Ionising radiation damages DNA directly and indirectly through increased production of reactive oxygen species. Although telomeres have been reported as indicators of radiosensitivity, their maintenance in response to occupational exposure to low radiation doses is still a matter of debate.

Methods: In this work we aimed to investigate telomere length and structure in hospital workers occupationally exposed to X-rays and to relate these findings to oxidation of biomolecules and chromosome aberrations. Blood samples of exposed participants and matching controls were taken during periodical check-ups. Chromosome aberrations and telomere length and structure were analysed in peripheral blood lymphocytes using Q-FISH, whereas oxidative stress parameters [pro/antioxidant balance (PAB), lipid peroxidation, and 8-oxo-dG] were measured in plasma samples. Based on the CA findings we divided the exposed group into two subgroups, of which one had chromosome aberrations in the first division metaphases and the other did not. **Results:** There was no significant difference in telomere length between any of the groups. However, both subgroups showed significantly higher rate of fragile telomeres and higher lipid peroxidation product and 8-oxo-dG levels than controls. The rate of fragile telomeres significantly correlated with plasma levels of 8-oxo-dG, which suggests that continuous exposure to low radiation doses induces oxidative base damage of guanine resulting in telomere fragility.

Tričković et al. 2022.

Archives of Industrial Hygiene and Toxicology, vol. 73, no. 1.

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Keywords: X-ray; chromosome aberrations; lipid peroxidation; telomere fragility; telomere length.

Evidence Level: 5B

Link: <https://sciendo.com/article/10.2478/aiht-2022-73-3609>

Occupational noise exposure and risk of incident stroke: A pooled study of five Scandinavian cohorts

Background: To investigate the association between occupational noise exposure and stroke incidence in a pooled study of five Scandinavian cohorts (NordSOUND). **Methods:** We pooled and harmonised data from five Scandinavian cohorts resulting in 78 389 participants. We obtained job data from national registries or questionnaires and recoded these to match a job-exposure matrix developed in Sweden, which specified the annual average daily noise exposure in five exposure classes (L_{Aeq8h}): < 70 , 70-74, 75-79, 80-84, ≥ 85 dB(A). We identified residential address history and estimated 1-year average road traffic noise at baseline. Using national patient and mortality registers, we identified 7777 stroke cases with a median follow-up of

20.2 years. Analyses were conducted using Cox proportional hazards models adjusting for individual and area-level potential confounders. **Results:** Exposure to occupational noise at baseline was not associated with overall stroke in the fully adjusted models. For ischaemic stroke, occupational noise was associated with HRs (95% CI) of 1.08 (0.98 to 1.20), 1.09 (0.97 to 1.24) and 1.06 (0.92 to 1.21) in the 75-79, 80-84 and ≥ 85 dB(A) exposure groups, compared with <70 dB(A), respectively. In subanalyses using time-varying occupational noise exposure, we observed an indication of higher stroke risk among the most exposed (≥ 85 dB(A)), particularly when restricting analyses to people exposed to occupational noise within the last year (HR: 1.27; 95% CI: 0.99 to 1.63). **Conclusions:** We found no association between occupational noise and risk of overall stroke after adjustment for confounders. However, the non-significantly increased risk of ischaemic stroke warrants further investigation.

Thacher et al. 2022.

Occupational and Environmental Medicine, vol. 21.

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Keywords: Epidemiology; noise; public health.

Evidence Level: 4B

Link: <https://oem.bmj.com/content/early/2022/04/21/oemed-2021-108053.long>

Musculoskeletal Health

This months explores the relationship between musculoskeletal health and pause exercises in office workers, the design of tram drivers workplaces, and workplace musculoskeletal health climate.

Corrective exercises administered online vs at the workplace for pain and function in the office workers with upper crossed syndrome: Randomized controlled trial

Background: To evaluate the effects of online-supervised versus workplace corrective exercises on neck-shoulder pain (NSP), sick leave, posture, workability, and muscular activity among office workers with the upper crossed syndrome (UCS). **Methods:** We performed a parallel-group randomized control trial at Shahid Beheshti University, Tehran, Iran, assigning 36 office workers to online-supervised, workplace, and control groups (mean (SD) age 38.91 ± 3.87 , 38.58 ± 7.34 , 37.00 ± 8.12). Inclusion criteria were alignment alteration (forward head ($\geq 45^\circ$), rounding shoulder ($\geq 52^\circ$), rounding back ($\geq 42^\circ$), and pain intensity ≥ 3 in neck and shoulder. The two intervention groups performed 8-week exercise program, while the control group continued usual activities. Primary (NSP and sick leave) and secondary outcomes [postural angles, workability, and muscular activity were measured by VAS, outcome evaluation questionnaire (OEQ), photogrammetry, workability index, and EMG, respectively, at the baseline and an 8-week follow-up].

Results: ANCOVA results revealed improvements for the online-supervised group versus control for NSP ($P = 0.007$), postural angles ($P = 0.000$, $P = 0.001$, $P = 0.005$), workability ($P = 0.048$, $P = 0.042$), and upper trapezius activation ($P = 0.024$, $P = 0.016$), respectively. Using paired t tests, both intervention groups improved from baseline to follow-up for NSP ($P = 0.000$, $P = 0.002$), forward head posture ($P = 0.000$, $P = 0.000$), round shoulders ($P = 0.001$, $P = 0.031$), and round back ($P = 0.034$, $P = 0.008$), respectively. Related parameters of workability ($P = 0.041$, $P = 0.038$), upper trapezius ($P = 0.005$, $P = 0.005$, $P = 0.022$), and serratus anterior ($P = 0.020$, $P = 0.015$) changed only in the online-supervised group. **Conclusion:** Online-supervised corrective exercise seems to improve a range of parameters related to work performance. These findings are highly applicable in light of the ongoing COVID pandemic; many workers have to work from home.

Yaghoubitajani et al. 2022.

International Archives of Occupational and Environmental Health, vol. 7, no. 1-16.

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Keywords: Muscle activation; neck-shoulder pain; online-supervised; postural malalignment; workability; workplace corrective exercises.

Evidence Level: 2B

Link: <https://link.springer.com/article/10.1007/s00420-022-01859-3>

Injury by design: A thematic networks and system dynamics analysis of work-related musculoskeletal disorders in tram drivers

Background: Tram driving is a safety critical task where work-related musculoskeletal disorders (WRMSDs) and injuries are associated with interacting occupational design factors over time. These interactions then carry implications for workforce retention, public safety, workplace relations and supports. To better understand such interactions, this study used thematic networks and system dynamics (causal loop diagrams) analysis with the aim to unearth a global theme underscoring occurrence of WRMSDs and describe the factors influencing the system dynamics of WRMSD occurrence in tram drivers.

Methods/Results: Building on earlier work focused on occupational participation, secondary analysis of driver interviews (n = 13) and driving observations (n = 11) produced thematic network and causal loop models of risk factors that highlighted an Injury by Design problem structure as a global theme. **Conclusion:** Research targeting organisational culture, human factors, and design standards is needed to minimise WRMSDs risk in tram drivers.

Naweed et al. 2022.

Applied Ergonomics, vol. 100.

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Keywords: Occupational injury; organisation behaviour; rail; risk perception; systems dynamics.

Evidence Level: 5A

Link: <https://www.sciencedirect.com/science/article/pii/S000368702100291X?via%3Dihub>

Enabling work participation for people with musculoskeletal conditions: lessons from work changes imposed by COVID-19: A mixed-method study

Background: To understand what we can learn from the impact of the COVID-19 pandemic and lockdown about what enables work participation for people with inflammatory arthritis and chronic pain conditions.

Methods: : Qualitative interviews embedded within an observational questionnaire study of individuals with musculoskeletal (MSK) conditions. Setting: UK primary care (general practices), and secondary care-based rheumatology services. Participants: Individuals with axial spondylarthritis, psoriatic arthritis and MSK pain from three established cohorts completed an online/paper-based questionnaire (July-December 2020). A subset of respondents were selected for semi structured interviews. Primary and secondary outcome measures: The survey quantified the effects of lockdown on work circumstances. Qualitative interviews explored the impacts of these changes and the advantages and disadvantages of changes in work circumstances. **Results:** 491 people (52% female, median age 49 years) who were employed at the time of lockdown responded to the questionnaire. The qualitative analysis included 157 free-text comments on work from the questionnaire and data collected within 18 interviews. Participants reported impacts on mental and physical health, and significant financial anxieties. The impact of work changes varied depending on individual and home circumstances. Some felt forced to ignore advice to shield and continue working. The flexibility offered by home working and changes in commuting enabled greater physical activity for some, while others missed the exercise normally undertaken as part of their commute. Others reported a constant need to be 'present' online, which heightened anxiety and worsened MSK symptoms. **Conclusion:** Lockdown showed that flexible working arrangements, which consider the positive and negative aspects of commuting, posture, movement, and work environment matter for work participation, and can have wider benefits in terms of health and well-being for those with long-term MSK conditions. Incorporating these into new models of work will help make the workplace more equitable and inclusive for people with long-term MSK conditions.

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Keywords: COVID-19; occupational & industrial medicine; qualitative research; rheumatology.

Evidence Level: 5B

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Musculoskeletal health climate is associated with musculoskeletal pain and sickness absence among workers: A cross-sectional study

Background: This study aimed to investigate whether a musculoskeletal health climate, expressing the shared perceptions among workers concerning musculoskeletal health, is associated with number of musculoskeletal pain sites and sickness absence. **Methods:** Design: Cross-sectional study. Setting: Six slaughterhouses from 2 companies in Denmark and 6 home-nursing units and 12 nursing homes from 1 municipality in Jutland, Denmark. Participants: A total of 1092 slaughter house workers and 410 care workers completed an online questionnaire from February to October 2019. Outcome measures: The exposure variable was musculoskeletal health climate assessed by two domains; (1) perceived management priority of musculoskeletal health measured by a modified subscale from the Nordic Safety Climate Questionnaire and (2) work group pain acceptance which was a modified version of the activity engagement subscale of the chronic pain acceptance scale. Outcomes variables were number of musculoskeletal pain sites (0-6) and days with sickness absence. **Results:** The associations between the two subscales, number of musculoskeletal pain sites and sickness absence were calculated using mixed linear and generalised estimating equation regression models. Higher perceived management priority scores were associated with a lower number of musculoskeletal pain sites across both job groups: $\beta = -0.57$ (95% CI -0.91 to -0.23) and sickness absence (>5 days) due to musculoskeletal pain prevalence ratio (PR) 0.79 (95% CI 0.57 to 1.08). In contrast higher work group pain acceptance scores were associated with higher number of musculoskeletal pain sites: $\beta = 0.38$ (0.11 to 0.66), whereas associations with sickness absences seemed to be modified by job groups; PR 1.59 care workers and PR 0.86 slaughterhouse workers. **Conclusion:** The observed relationship between musculoskeletal health climate, musculoskeletal pain sites and sickness absence indicate that cultural factors should receive increased attention in work place preventive interventions.

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Keywords: Epidemiology; occupational & industrial medicine; preventive medicine.

Evidence Level: 4B

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