



Emerging Evidence Alert October 2021

This Emerging Evidence Alert includes the latest peer-reviewed articles, reports and evidence on a range of workplace health and safety, prevention, recovery at work and return to work topics. It provides a review of recent journal articles and relevant content related to Comcare’s five research themes: Fostering Work Participation; Building Employer Capability; Adapting to the Future of Work; Guiding and Supporting Mental Health and Wellbeing; and Enabling Healthy and Safe Workplaces. Collated articles were published in September 2021 only.

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Monthly research highlight

Does healthy leadership support organisational health promotion and prevention?

As workers continue to adapt to ongoing changes due to COVID-19 lockdowns and restrictions, employers, managers and supervisors need to take a more proactive role to support worker health and wellbeing.

A [recent study](#) has found leaders who take responsibility for their own health, as well as implement health promotion programs can influence a healthier workplace culture.

From qualitative interviews with 40 employees from Austria and Germany, it was shown that:

- Employees recognise the potential of the workplace as an environment where their health can be enhanced
- Implementation of Workplace Health Promotion (WPHP) programs can be improved
- Healthy leadership can support positive responses to organisational offerings

The study concluded by highlighting the need for organisations to take a holistic approach towards health. Companies currently underestimate the potential for healthy leadership and organisational health promotion. Employers can improve workplace culture by increasing WPHP measures, through healthy leadership as well as supporting WPHP measures.

For more informational about promoting a healthy workplace, visit the Comcare website for guidance on supporting [health](#) and [wellbeing](#). Resources available are suitable for both employers and employees and include factsheets, videos, tips and more.

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

How can social insurers promote return to work in occupational rehabilitation? A quantitative, cross-sectional study

Background: Earlier studies indicate a correlation between disability claims experience and return to work outcomes. Thus, the insurer's role and actions may affect the self-rated health of the disabled worker and the outcomes of occupational rehabilitation. This study diversifies the existing empirical evidence on the role of the insurer in the rehabilitation process and reveals the critical actions that best promote success.

Materials and methods: Explorative factor analysis (EFA) and confirmatory factor analysis (CFA), followed by binary regression, were used to analyse survey data of disabled workers (n = 661) who had undergone an occupational rehabilitation within an earnings-related pension insurance system in Finland. **Results:** The claimant's perceptions of the insurer's (1) high-quality informing and guidance, (2) customer orientation, (3) smooth process flow and (4) positive service attitude had substantial and statistically significant effects on the success of occupational rehabilitation after adjusting for all likely confounding variables.

Conclusions: The insurer's actions are significant predictors of the outcome of occupational rehabilitation. The insurer can promote the health of rehabilitees most effectively by ensuring a smooth process flow and adopting a customer-oriented approach.

Pasanen et al. 2021.

BMC Public Health, vol. 21 no. 1.

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Keywords: Disability insurance; Insurers; Occupational rehabilitation; Return to work.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-11758-w>

Factors of decisive importance for being in work or not during two years after breast cancer surgery: content analysis of 462 women's open answers

Background: Paid work is one of the most important aspects in life among working-aged women diagnosed with breast cancer. Despite several attempts, no previous study provides a comprehensive overview from the women's perspective about factors of importance for being able to work or not. Therefore, the aim of this study was to gain knowledge about factors that women themselves state are of decisive importance for being able to work or not during the first two years after breast cancer surgery. **Methods:** Data was collected in a two-year follow-up questionnaire within the frame of a prospective cohort study of working-aged women who had undergone breast cancer surgery. 749 were included in the questionnaire study and of the 616 (82%) responding women, 462 (75%) wrote statements on an open-ended question about factors of decisive importance for being able to work or not work during the past two years. The statements were analyzed with content analysis. **Results:** Five categories of factors of importance for being able to work or not were identified, each covering several sub-categories: Health and wellbeing, Contacts and encounters, Flexibility and adjustment possibilities, Socioeconomic consequences from working/not working, and Own motivation and characteristics. A wide variety of factors were mentioned by the women and the findings give a multifaceted picture of many single but interrelated factors of decisive importance for being able to work/not work. The importance of flexibility in the return-to-work process was stressed, as well as the importance of supportive encounters from, e.g., colleagues, managers, as well as relatives.

Conclusions: The results give a comprehensive overview over a variety of different types of factors for being able to return to/remain in work or to not work after breast cancer surgery, adding new knowledge about e.g. the importance of colleagues, and the women's own preferences or characteristics. These are factors that different stakeholders, both from healthcare but also from the work place and the insurance office, need to be aware of and collaborate around to support women with breast cancer during the period of treatment, rehabilitation and return to work.

Wennman-Larsen et al. 2021.

BMC Women's Health, vol. 21, no. 1.

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Keywords: Breast cancer; Insurance medicine; Return-to-work; Sick leave; Sickness absence; Women; Work.

Evidence Level: 5B

Link: <https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-021-01468-1>

The Return-to-Work Self-efficacy Questionnaire (RTW-SE): a validation study of predictive abilities and cut-off values for patients on sick leave due to anxiety or depression

Purpose: This study aimed to evaluate the validity of the Return-to-Work Self-efficacy Questionnaire (RTW-SE) in a Norwegian sample of patients with common mental disorders. The secondary aim was to provide validated cut-off scores for the RTW-SE. **B:** Among patients receiving work-focused therapy (N = 626), the RTW-SE was measured pre-and post-treatment, and work status was assessed up to one-year post-treatment. The factor structure, internal consistency and construct validity were assessed. Furthermore, post-treatment cut-off scores were calculated using receiver operating characteristic (ROC) analysis for patients on sick leave at baseline (n = 314) and at the end of treatment (n = 145). The predictive ability of the suggested RTW-SE cut-off scores were investigated longitudinally. **Results:** Exploratory principal component analysis identified a one-factor solution with high internal consistency (0.91). RTW-SE exhibited small to moderate negative correlations with measures of depression and anxiety, and was significantly different between subgroups of patients with different work status, supporting construct validity. Pre- and post-treatment RTW-SE scores significantly predicted full return to work at 3, 6 and 12 months post-treatment. ROC analysis suggested an upper cut-off score of 4.6, associated with full RTW, and lower cut-off score of 3.7, associated with partial RTW. These cut-offs showed acceptable discriminative ability and significant longitudinal predictive ability. **Conclusion:** The RTW-SE possesses good psychometric properties and the suggested cut-off scores have significant predictive ability in a clinical setting.

Gjengedal et al. 2021.

Journal of Occupational Rehabilitation, vol. 31, no. 3.

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Keywords: Anxiety; Common mental disorders; Depression; Return to work interventions; Return-to-work self-efficacy; Sick leave.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-09957-8>

Fatigue in men and women who have returned to work after stroke: Assessed with the Fatigue Severity Scale and Mental Fatigue Scale

Objective: To assess the occurrence of self-reported fatigue among men and women who have returned to work after stroke, and the association between 2 fatigue rating scales. **Design:** A cross-sectional study.

Subjects: A total of 91 adults (58 men/33 women, mean age 53 years) with mild to moderate disability.

Methods: Questionnaires were posted to participants approximately one year after stroke. Fatigue was assessed with the Fatigue Severity Scale (FSS) and the Mental Fatigue Scale (MFS). **Results:** In total, 58% of the women and 33% of the men reported fatigue on the FSS (total score ≥ 4), and 46% of the women and 28% of the men reported mental fatigue on the MFS (total score ≥ 10.5). Being easily fatigued, decreased motivation, mental fatigability and sensitivity to stress were the most reported problems. FSS and MFS were moderately associated (ρ 0.517-0.732). **Conclusion:** Fatigue is common among persons who have returned to work after stroke, and interferes with daily life. The long-term consequences of fatigue should be addressed after stroke, especially in women. The FSS and the MFS can be used in combination, as they provide information on different aspects of fatigue.

Norlander et al. 2021.

Journal of Rehabilitation Medicine, vol. 53, no. 9.

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Keywords: Cerebral stroke; Data correlation; Disability evaluation; Mental fatigue; Return to work; Self-assessment; Stroke rehabilitation.

Evidence Level: 4A

Link: <https://www.medicaljournals.se/jrm/content/abstract/10.2340/16501977-2863>

A systematic search and review of questionnaires measuring individual psychosocial factors predicting return to work after musculoskeletal and common mental disorders

Purpose: Individual psychosocial factors are crucial in the return to work (RTW) process of workers with musculoskeletal disorders (MSDs) and common mental disorders (CMDs). However, the quality and validity of the questionnaires used to measure these factors have rarely been investigated. The present systematic search and literature review aims at identifying, categorizing, and evaluating the questionnaires (measurement tools) used to measure individual psychosocial factors related to the perception of the personal condition and motivation to RTW that are predictive of successful RTW among workers with MSDs or CMDs. **Methods:** Through a systematic search on PubMed, Web of Science, and PsycINFO library databases and grey literature, we identified the individual psychosocial factors predictive of successful RTW among these workers. Then, we retrieved the questionnaires used to measure these factors. Finally, we searched for articles validating these questionnaires to describe them exhaustively from a psychometric and practical point of view. **Results:** The review included 76 studies from an initial pool of 2263 articles. Three common significant predictors of RTW after MSDs and CMDs emerged (i.e., RTW expectations, RTW self-efficacy, and work ability), two significant predictors of RTW after MSDs only (i.e., work involvement and the self-perceived connection between health and job), and two significant predictors of RTW after CMDs only (i.e., optimism and pessimism). We analyzed 30 questionnaires, including eight multiple-item scales and 22 single-item measures. Based on their psychometric and practical properties, we evaluated one of the eight multiple-item scales as questionable and five as excellent. **Conclusions:** With some exceptions (i.e., self-efficacy), the tools used to measure individual psychosocial factors show moderate to considerable room for improvement.

Gagnano et al. 2021.

Journal of Occupational Rehabilitation, vol. 31, no. 3.

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Keywords: Common mental disorders; Measurement tools; Musculoskeletal disorders; Psychosocial factors; Return to work.

Evidence Level: 1A

Link: <https://link.springer.com/article/10.1007%2Fs10926-020-09935-6>

Beliefs about return to work among women during/after long-term sick leave for common mental disorders: A qualitative study based on the theory of planned behaviour

Purpose: Long-term sick leave due to common mental disorders (CMDs) is an increasing problem, especially among women. To help these women return to work (RTW) sustainably, we need to know more about their own beliefs about RTW. One applicable theory is the theory of planned behaviour (TPB). Thus, the present study aimed to describe, based on the TPB, women's beliefs about RTW during or after long-term sick leave for a CMD. **Methods:** A qualitative approach was used. Twenty women were included during a long-term sick leave period due to a CMD. A deductive content analysis was conducted using predetermined factors from the TPB: behavioural beliefs (advantages-disadvantages of RTW), normative beliefs (supporters and non-supporters of RTW), and control beliefs (facilitators of-barriers to RTW). **Results:** The women believed that RTW would give them meaning and balance in life, but also that it would be challenging to maintain balance after RTW. They believed they had several supporters of RTW, but that the support was sometimes perceived as stressful rather than encouraging. Furthermore, individual adaptation and high demands were the most mentioned facilitator and barrier, respectively. Workplace conditions and personal strategies were thought to be important aspects. **Conclusions:** By using the TPB, the present study was able to offer new findings on women's beliefs about RTW after long-term sick leave for a CMD. Based on the findings, we suggest that various RTW stakeholders should focus on striving to provide the tasks and work pace women need so they can maintain their professional competence and sense of meaning.

Hedlund et al. 2021.

Journal of Occupational Rehabilitation, vol. 31, no. 3.

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Keywords: Common mental disorders; Return to work; Sick leave; Women.

Evidence Level: 5A

Link: <https://link.springer.com/article/10.1007%2Fs10926-020-09946-3>

Recovery courses of patients who return to work by 3, 6 or 12 months after Total Knee Arthroplasty

Purpose: This study compared the preoperative levels and postoperative recovery courses of physical and mental impairments, activity limitations and participation restrictions of working-age patients who return to work (RTW) by 3, 6 or 12 months after total knee arthroplasty (TKA). **Methods:** A prospective survey study including TKA patients (aged < 65) (n = 146) who returned to work (RdTW) in the first postoperative year. Three groups were compared: those who returned by 3 (n = 35), 6 (n = 40) or 12 (n = 29) months. Surveys were completed preoperatively and at 6 weeks and 3, 6 and 12 months postoperatively. Outcomes represented domains of the International Classification of Functioning, i.e. physical impairments (pain, stiffness, vitality), mental impairments (mental health and depressive symptoms), activity limitations (physical functioning) and participation restrictions (social and work functioning). **Results:** Preoperative knee-specific pain and physical functioning levels were better among patients who RdTW by 3 months, compared to those who returned by 12 months. Patients who RdTW by 3 months experienced significantly better recovery from physical impairments than those who returned by 6 months (on general pain) or 12 months (on general and knee-specific pain and on stiffness). Patients returning by 3 months experienced significantly better recovery from activity limitations (on knee-specific physical functioning). **Conclusions:** To optimize return to work outcome after TKA surgery, the focus should lie on physical impairments (general and knee-specific pain, stiffness) and activity limitations (knee-specific physical functioning) during recovery.

Hylkema et al. 2021.

Journal of Occupational Rehabilitation, vol. 31, no. 3.

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Keywords: Knee replacement; Longitudinal; Outcomes; Recovery; Return to work.

Evidence Level: 4A

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-09959-6>

Getting the message right: Evidence-based insights to improve organizational return-to-work communication practices

Purpose: There is an absence of evidence-based guidance to support workplace stakeholders in the effective delivery of return-to-work (RTW) messages. Our study examines the specific RTW communication practices and their impact on the management of work disability. **Methods:** Within two large and complex healthcare organizations, semi-structured interviews were conducted with workplace stakeholders (e.g., supervisors, union representatives, disability management professionals and workers' compensation representatives) and workers who had previously experienced sickness absence related to an occupational injury or illness. For workplace stakeholders interview questions asked about their roles and responsibilities in the RTW process, and specific communication strategies and messages that were used at different phases of the RTW process. For worker participants, interview questions explored RTW experiences and the impact of communication on work re-integration. An interpretative descriptive approach was used to inductively examine themes from interviews to create ways of understanding phenomena that yielded applied findings. **Results:** Forty participants were interviewed including workplace stakeholders and workers. Participants frequently described effective RTW communication as messages that were delivered by a workplace stakeholder that included the content required by an injured worker to navigate the organizational disability management process and utilized specific strategies to address the perceived attitudes and perceptions held by an injured worker regarding work re-integration. Workplace stakeholders described five specific communication strategies including relaying messages of support, optimizing the timing of communication, careful word choice, framing messages, and tailoring communication to the injured worker. **Conclusion:** RTW communication is an active process that requires a strategic approach. Effective communication practices represent an important strategy for workplace stakeholders to address the barriers held by injured workers and foster early and sustained RTW.

Jetha et al. 2021.

Journal of Occupational Rehabilitation, vol. 31, no. 3.

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Keywords: Communication practices; Disability managers; Message framing; Organizational disability management; Return-to-work; Tailoring return-to-work communication.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-09961-y>

Working Hours

Association of weekly working hours with poor psychological well-being and moderation by employment status in Korean workers

We examined the association of weekly working hours with poor psychological wellbeing in Korean workers and the moderating effect of employment status. This secondary analysis examined data from the fifth Korean Working Conditions Survey (2017). There were 30,108 waged employees and 14,459 self-employed individuals. The two groups were compared using a moderated regression model with Hayes' PROCESS macro for SPSS. The self-employed had a greater mean age than the waged employees. Higher percentages of the self-employed had short weekly working hours (<40), excessively long weekly working hours (≥60), and poor psychological well-being. After controlling for age, gender, education, monthly income, and occupational class, the interaction between weekly working hours and employment status on psychological well-being was significant ($p < 0.001$). Among the self-employed, the well-being score was lowest in the short working hour group (<40 h/week), highest in the long working hour (48-59 h/week) groups, and intermediate in the excessively long working hours (≥60 h/week) group. For waged employees, psychological wellbeing was the greatest in the short working hour group and decreased continuously as the number of weekly working hours increased. In conclusion, employment status (employee vs. self-employed) moderated the relationship between weekly working hours and psychological well-being.

Park et al. 2021.

Industrial Health, vol. 59, no. 4.

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Keywords: Employment; Moderation; Self-employed; Well-being; Working hour.

Evidence Level: 4B

Link: https://www.jstage.jst.go.jp/article/indhealth/59/4/59_2021-0019/_article

Building Employer Capability

Wellness Programs

Effectiveness of workplace wellness programmes for dietary habits, overweight, and cardiometabolic health: a systematic review and meta-analysis

Background: The workplace offers a unique opportunity for effective health promotion. We aimed to comprehensively study the effectiveness of multicomponent worksite wellness programmes for improving diet and cardiometabolic risk factors. **Methods:** We did a systematic literature review and meta-analysis, following PRISMA guidelines. We searched PubMed-MEDLINE, Embase, the Cochrane Library, Web of Science, and Education Resources Information Center, from Jan 1, 1990, to June 30, 2020, for studies with controlled evaluation designs that assessed multicomponent workplace wellness programmes. Investigators independently appraised the evidence and extracted the data. Outcomes were dietary factors, anthropometric measures, and cardiometabolic risk factors. Pooled effects were calculated by inverse-variance random-effects meta-analysis. Potential sources of heterogeneity and study biases were evaluated. **Findings:** From 10 169 abstracts reviewed, 121 studies (82 [68%] randomised controlled trials and 39 [32%] quasi-experimental interventions) met the eligibility criteria. Most studies were done in North America (57 [47%]), and Europe, Australia, or New Zealand (36 [30%]). The median number of participants was 413.0 (IQR 124.0-904.0), and median duration of intervention was 9.0 months (4.5-18.0). Workplace wellness programmes improved fruit and vegetable consumption (0.27 servings per day [95% CI 0.16 to 0.37]), fruit consumption (0.20 servings per day [0.11 to 0.28]), body-mass index (-0.22 kg/m² [-0.28 to -

0.17)), waist circumference (-1.47 cm [-1.96 to -0.98]), systolic blood pressure (-2.03 mm Hg [-3.16 to -0.89]), and LDL cholesterol (-5.18 mg/dL [-7.83 to -2.53]), and to a lesser extent improved total fat intake (-1.18% of daily energy intake [-1.78 to -0.58]), saturated fat intake (-0.70% of daily energy [-1.22 to -0.18]), bodyweight (-0.92 kg [-1.11 to -0.72]), diastolic blood pressure (-1.11 mm Hg [-1.78 to -0.44]), fasting blood glucose (-1.81 mg/dL [-3.33 to -0.28]), HDL cholesterol (1.11 mg/dL [0.48 to 1.74]), and triglycerides (-5.38 mg/dL [-9.18 to -1.59]). No significant benefits were observed for intake of vegetables (0.03 servings per day [95% CI -0.04 to 0.10]), fibre (0.26 g per day [-0.15 to 0.67]), polyunsaturated fat (-0.23% of daily energy [-0.59 to 0.13]), or for body fat (-0.80% [-1.80 to 0.21]), waist-to-hip ratio (-0.00 ratio [-0.01 to 0.00]), or lean mass (1.01 kg [-0.82 to 2.83]). Heterogeneity values ranged from 46.9% to 91.5%. Between-study differences in outcomes were not significantly explained by study design, location, population, or similar factors in heterogeneity analyses. **Interpretation:** Workplace wellness programmes are associated with improvements in specific dietary, anthropometric, and cardiometabolic risk indicators. The heterogeneity identified in study designs and results should be considered when using these programmes as strategies to improve cardiometabolic health. **Funding:** National Heart, Lung, and Blood Institute.

Peñalvo et al. 2021.

The Lancet – Public Health, vol. 6, no. 9.

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Keywords: Workplace wellness program; Dietary habits; Obesity; Cardiometabolic health.

Evidence Level: 1A

Link: [https://linkinghub.elsevier.com/retrieve/pii/S2468-2667\(21\)00140-7](https://linkinghub.elsevier.com/retrieve/pii/S2468-2667(21)00140-7)

Effects of an artificial intelligence-assisted health program on workers with neck/shoulder pain/stiffness and low back pain: Randomized controlled trial

Background: Musculoskeletal symptoms such as neck and shoulder pain/stiffness and low back pain are common health problems in the working population. They are the leading causes of presenteeism (employees being physically present at work but unable to be fully engaged). Recently, digital interventions have begun to be used to manage health but their effectiveness has not yet been fully verified, and adherence to such programs is always a problem. **Objective:** This study aimed to evaluate the improvements in musculoskeletal symptoms in workers with neck/shoulder stiffness/pain and low back pain after the use of an exercise-based artificial intelligence (AI)-assisted interactive health promotion system that operates through a mobile messaging app (the AI-assisted health program). We expected that this program would support participants' adherence to exercises. **Methods:** We conducted a two-armed, randomized, controlled, and unblinded trial in workers with either neck/shoulder stiffness/pain or low back pain or both. We recruited participants with these symptoms through email notifications. The intervention group received the AI-assisted health program, in which the chatbot sent messages to users with the exercise instructions at a fixed time every day through the smartphone's chatting app (LINE) for 12 weeks. The program was fully automated. The control group continued with their usual care routines. We assessed the subjective severity of the neck and shoulder pain/stiffness and low back pain of the participants by using a scoring scale of 1 to 5 for both the intervention group and the control group at baseline and after 12 weeks of intervention by using a web-based form. We used a logistic regression model to calculate the odds ratios (ORs) of the intervention group to achieve to reduce pain scores with those of the control group, and the ORs of the subjective assessment of the improvement of the symptoms compared to the intervention and control groups, which were performed using Stata software (version 16, StataCorp LLC). **Results:** We analyzed 48 participants in the intervention group and 46 participants in the control group. The adherence rate was 92% (44/48) during the intervention. The participants in the intervention group showed significant improvements in the severity of the neck/shoulder pain/stiffness and low back pain compared to those in the control group (OR 6.36, 95% CI 2.57-15.73; $P < .001$). Based on the subjective assessment of the improvement of the pain/stiffness at 12 weeks, 36 (75%) out of 48 participants in the intervention group and 3 (7%) out of 46 participants in the control group showed improvements (improved, slightly improved) (OR 43.00, 95% CI 11.25-164.28; $P < .001$). **Conclusions:** This study shows that the short exercises provided by the AI-assisted health program improved both neck/shoulder pain/stiffness and low

back pain in 12 weeks. Further studies are needed to identify the elements contributing to the successful outcome of the AI-assisted health program.

Anan et al. 2021.

JMIR Mhealth Uhealth, vol. 9, no. 9.

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Keywords: Digital health; Digital intervention; eHealth; Low back pain; mHealth; Mobile app; Mobile phone; Musculoskeletal symptoms; Neck pain; Shoulder pain; Shoulder stiffness.

Evidence Level: 2A

Link: <https://mhealth.jmir.org/2021/9/e27535/>

New technologies in the workplace: Can personal and organizational variables affect the employees' intention to use a work-stress management app?

Organizations are interested in finding new and more effective ways to promote the well-being of their workers, to help their workers manage work-related stress. New technologies (e.g., smartphones) are cheaper, allow more workers to be reached, and guarantee their anonymity. However, not all employees agree on the use of new technological interventions for the promotion of well-being. Consequently, organizations need to investigate technological acceptance before introducing these tools. By considering the technology acceptance model (TAM) framework, we investigate both the influence of workers' perceived usefulness and ease of use on their intentions to use apps that help them managing work stress. Moreover, we contribute to the extension of this model by considering both personal (i.e., self-efficacy, personal innovativeness) and organizational (i.e., organizational support for innovation) variables. Our research involved 251 participants who completed an online self-report questionnaire. The results confirm the central hypothesis of the TAM and the influence of other variables that could influence acceptance of new technologies, such as apps that help manage work stress, and the intentions to use them. These results could help organizations ensure technological acceptance and usage by their workers, increasing the effectiveness of new technologies and interventions to promote well-being.

Paganin et al. 2021.

International Journal of Environmental Research and Public Health, vol. 18, no. 17.

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Keywords: New technologies; Smartphone-based interventions; Stress management interventions; Technology acceptance; Well-being promotion interventions.

Evidence Level: 4A

Link: <https://www.mdpi.com/1660-4601/18/17/9366>

Organisational Issues

Occupational health protection for health workers in China with lessons learned from the UK: Qualitative interview and policy analysis

Background: Healthcare settings have been recognized among the most hazardous places to work. Based on the five categories of occupational hazards that were identified by the ILO and WHO, this study aimed to analyze policy framework relevant to occupational health protection of health workers (HWs) in public health service in China, then discussed how to share the experience of the National Health Service (NHS) England for improvement. **Methods:** Based on policy learning theories, policy analysis and qualitative interview were used in this study. **Results:** In the Chinese public health service, at least five laws related to the regulation of occupational health protection for HWs; however, enforcement of relevant laws was separated and multi-centered; the national monitoring system, which targeted to occupational hazards and health outcome for HWs in China, had yet to be developed; the top three priorities were workplace violence, bloodborne pathogens, and musculoskeletal disorders; national strategies included Security Hospital, and Healthy China 2030. In NHS England, three laws were fundamental; several monitoring systems had been set up, including NHS Staff Survey, Commissioning for Quality and Innovation incentive scheme; mental health, musculoskeletal problem, and nutrition disorder and overweight were raised great concern; Health and Safety, and NHS Healthy Workforce Program were critical nationwide strategies.

Conclusion: There were several similarities as well as differences between the Chinese public health system and NHS England, which laid foundation of learning by China. Recommendations of improving occupational health policies in China were provided, based on the lessons learned from the NHS England.

Xu et al. 2021.

Safety and Health at Work, vol. 12, no. 3.

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Keywords: China; National Health Service; Health worker; Occupational health and safety; Public health service.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S2093791121000135?via%3Dihub>

Job insecurity and job performance: A serial mediated relationship and the buffering effect of organizational justice

The study aimed to extend the current knowledge of the relationship between job insecurity and performance. In line with traditional stress theories, work-family and burnout were hypothesized as serial mediators of the negative link between job insecurity and job performance. Also, the current study hypothesized that the association between job insecurity and the mediators [i.e., Work-family conflict (WFC) and burnout] could be buffered by perceived organizational justice among employees. Therefore, we empirically tested a moderated serial mediation model. Participants were 370 employees of an Italian multiservice social cooperative. Data were collected using a self-report questionnaire in the aftermath of the COVID-19 pandemic outbreak. The obtained results indicated that WFC and burnout mediated the association between job insecurity and job performance. Furthermore, perceived organizational justice buffered the relationship between job insecurity and WFC. Concerning job burnout, the association with job insecurity was moderated only among employees perceiving medium and high levels of organizational justice. The moderated serial mediation index provided support to the role of organizational justice in decreasing the association between job insecurity and job performance. This study delves deeper into the variables explaining the relationship between job insecurity and job performance by testing a serial process mechanism that involved WFC and burnout. Additionally, the obtained results provide suggestions to organizations and managers regarding the protective role of organizational justice to sustain employees' mental health and performance. Practical implications at the organizational and managerial level are provided, along with a focus on the actual impact of the pandemic.

De Angelis et al. 2021.

Frontiers in Psychology, vol. 12.

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Keywords: Burnout; Job insecurity; Moderated mediation; Organizational justice; Performance; Work-family conflict.

Evidence Level: 5B

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.694057/full>

Does it matter what your reasons are when deciding to disclose (or not disclose) a disability at work? The association of workers' approach and avoidance goals with perceived positive and negative workplace outcomes

Deciding whether to disclose a disability to others at work is complex. Many chronic mental and physical health conditions are associated with episodic disability and include times of relative wellness punctuated by intermittent periods of activity limitations. This research draws on the disclosure processes model to examine approach and avoidance disclosure and non-disclosure goals and their association with perceived positive and negative workplace outcomes. Participants were 896 employed individuals (57.7% women) living with a chronic physical or mental health/cognitive condition. They were recruited from an existing national panel and completed an online, cross-sectional survey. Participants were asked about disclosure decisions, reasons for disclosure/non-disclosure, demographic, work context and perceived positive and negative disclosure decision outcomes (e.g., support, stress, lost opportunities). About half the sample (51.2%) had disclosed a disability to their supervisor. Decisions included both approach and avoidance

goals. Approach goals (e.g., desire support, want to build trust, maintain the status quo at work) were significantly associated with perceived positive work outcomes regardless of whether a participant disclosed or did not disclose a disability at work, while avoidance goals (e.g., concerns about losing one's job, feeling forced to disclose because others notice a problem) were associated with perceived negative work outcomes. The findings highlight benefits and challenges that workers perceive arise when they choose to disclose or not disclose personal health information. By better understanding disclosure decisions, we can inform organizational health privacy and support gaps to help sustain the employment of people living with disabilities.

Gignac et al. 2021.

Journal of Occupational Rehabilitation, vol. 31, no. 3.

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Keywords: Disability; Disclosure; Episodic disabilities; Mental health; Work outcomes.

Evidence Level: 5A

Link: <https://link.springer.com/article/10.1007%2Fs10926-020-09956-1>

Job Design

In the eye of the beholder: Challenge and hindrance appraisals of work characteristics and their implications for employee's well-being

Previous research on the association between job characteristics and employee well-being has returned mixed results. In particular, the possible impact of individual appraisal of these job characteristics has not been well-acknowledged. To address this limitation, we drew on appraisal theory and examined: (a) how workers appraise particular job characteristics, and (b) how these appraisals affect the relationships between these job characteristics and well-being (i.e., work engagement and burnout). We tested our hypotheses across two studies. In a cross-occupation sample (Study 1, $n = 514$), we found that job demands and resources can be appraised as both challenges and hindrances. In addition, challenge appraisals can mitigate the detrimental impact of job demands on engagement and burnout; and hindrance appraisals can strengthen the detrimental effects of job demands on burnout. Further, hindrance appraisals of job resources reduce their beneficial effects on engagement and burnout. Study 2 ($n = 316$ nurses in a hospital) further showed that challenge appraisals of job demands can reduce their impact on burnout while challenge appraisals of job resources will strengthen their positive effect on employee engagement and burnout. We discuss study implications as well as future research directions.

Li et al. 2021.

Frontiers in Psychology, vol. 7

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Keywords: Challenge appraisal; Employee well-being; Hindrance appraisal; Job demands; Job resources.

Evidence Level: 4B

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.708309/full>

Shift Work

The acute effects of working time patterns on fatigue and sleep quality using daily measurements of 6195 observations among 223 shift workers

Objectives: This study aimed to estimate acute effects of roster characteristics on fatigue and sleep quality and investigated whether these effects differed by individual characteristics. **Methods:** Using an ecological measurement assessment survey, fatigue and sleep quality were daily measured among 223 shift workers for up to eight weeks. A questionnaire assessed baseline characteristics, and roster data were retrieved from the company registers to determine roster parameters. The effects between each shift parameter on fatigue and sleep quality were estimated with random- and fixed-effects models. **Results:** Compared to day shifts, night shifts were related to fatigue [$\beta=0.22$; 95% confidence interval (CI) 0.05-0.39] and poorer sleep quality ($\beta=0.64$; 95% CI 0.47-0.80), and more successive night shifts with more fatigue (up to $\beta=0.68$; 95% CI 0.49-0.87 for ≥ 2 nights). Fatigue was increased after a quick return (<11 hours) ($\beta=1.94$; 95% CI 1.57-2.31)

or 11-16 hours ($\beta=0.43$; 95% CI 0.26-0.61) compared to >16 hours between shifts. Compared to forward rotation, stable ($\beta=0.22$; 95% CI 0.01-0.43) and backward rotation ($\beta=0.49$; 95% CI 0.23-0.74) were also associated with more fatigue. Workers with a morning or intermediate chronotype had poorer sleep quality after a night shift, while workers with poor health reported poor sleep quality as well as more fatigue after a night shift. **Conclusions:** To alleviate acute effects of shift work on fatigue, shift schedules should be optimized by ensuring more time to recover and rotate forwards.

van de Ven et al. 2021.

Scandinavian Journal of Work, Environment and Health, vol. 47, no. 6.

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Keywords: Fatigue; Sleep quality; Working patterns; Shift workers.

Evidence Level: 5A

Link: <https://www.sjweh.fi/article/3964>

Night-shift work duration and breast cancer risk: an updated systematic review and meta-analysis

Background: The International Agency for Research on Cancer (IARC) has classified shift work as a possible human carcinogen. The results of systematic on this topic is contradictory. This systematic review and meta-analysis, therefore, aimed to update the current evidence regarding the relationship between night-shift work duration and breast cancer risk. **Methods:** PubMed, Web of Science, and Scopus as well as reference list of included studies were searched until December 19, 2020. Observational case-control or cohort studies investigating the relationship between the duration of night-shift work and breast cancer in women were included, which all quantified night-shift work exposure. All statistical analyses were done by Stata version 11.2. **Results:** Our literature search was resulted in retrieval of 4854 publications from which 26 eligible studies with 1,313,348 participants were included in the meta-analyses. The pooled relative risk (RR) and 95% confidence intervals (CIs) of breast cancer for short-term night-shift workers (< 10 years) was 1.13 (95% CI 1.03-1.24, $p = 0.008$, $I^2 = 71.3\%$), and for long-term night-shift workers (≥ 10 years) was 1.08 (95% CI 0.99-1.17, $p = 0.09$, $I^2 = 42.2\%$), with moderate to substantial statistical heterogeneity observed in both analyses. The results of subgroup analysis showed that flight attendants with long overnight flights were at an elevated risk of breast cancer, but unmeasured confounders limited these results. The risk of breast cancer in case control studies, adjusted for reproductive factors and family history of breast cancer as well as studies with high quality was increased in both short term and long term night-shift workers. **Conclusions:** This systematic review found a positive statistical relationship between night work and breast cancer risk in short-term night-shift workers but no increase was observed in the long-term night-shift workers.

Manouchehri et al. 2021.

BMC Public Health, vol. 21, no. 1.

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Keywords: Breast cancer; Meta-analysis; Night-shift work; Shift-work; Systematic review.

Evidence Level: 1A

Link: <https://bmcwomenshealth.biomedcentral.com/articles/10.1186/s12905-021-01233-4>

Sleep-scheduling strategies in hospital shiftworkers

Introduction: Shiftwork causes circadian disruption and results in impaired performance, sleep, and health. Often, individuals on non-standard shifts cannot modify work schedules. At-home sleep schedules are a potentially modifiable point of intervention, yet sleep-scheduling strategies remain relatively understudied. Specifically, the adoption of multiple strategies and the employment of strategies for not only night shifts, but also early starts on days, have yet to be formally examined to our knowledge. We studied how adoption of specific and/or multiple sleep-scheduling strategies for day and night shifts relates to measures of adaptation to shiftwork, self-reported on-shift sleepiness, and individual characteristics (eg, age, chronotype, education in circadian and sleep health). We hypothesized: 1) strategies would differ by shift type, 2) individuals would adopt multiple strategies, 3) strategies better aligned with circadian principles would relate to measures of adaptation, and 4) individual characteristics, such as having dependents, would relate to strategy selection. **Methods:** A retrospective, online questionnaire (including items from the Survey of Shiftworkers and items related to sleep-scheduling strategies) was administered to both

permanent and rotating hospital staff in four wards working 12-h day and/or night shifts (n=89). Additionally, reasons for strategy selection were explored. **Results:** Level of adaptation varied by sleep-scheduling strategy, with the least adaptation for those utilizing the Incomplete Shifter strategies. For night shifts, Night Stay and Switch Sleeper-N strategies were related to lower mid-shift sleepiness. Many night workers reported using strategies that restricted sleep, and most reported using multiple strategies, both of which also related to lower adaptation. Domestic considerations were the most common rationale for strategy selection. Strategies varied by several individual characteristics, including chronotype, dependents, and level of sleep education. **Discussion:** Future work should investigate sleep strategies and circadian interventions to help mitigate the effects of circadian and sleep disruption in hospital staff.

Harrison et al. 2021.

Nature and Science of Sleep, vol. 21.

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

Keywords: Alertness; Circadian; Military; Naps; Nurses.

Evidence Level: 4A

Link: <https://www.dovepress.com/sleep-scheduling-strategies-in-hospital-shiftworkers-peer-reviewed-fulltext-article-NSS>

Management and Leadership

Healthy leadership and workplace health promotion as a pre-requisite for organizational health

Background: Increasing stress levels at the workplace constitute a concerning organizational trend, challenging not only employees but also organizations alike, as it is in most instances associated with increasing workloads. In consequence, employees have started to demand that organizations begin to accept responsibility for their health and well-being. The present contribution seeks to investigate, to which extent individuals are able to deal with stress and whether their employers and respective supervisors (leaders) accept responsibility for their health, for instance, by leading by example. In addition, the existence and support generated by the organization in form of Workplace Health Promotion (WPHP) is inquired. **Methods:** Semi-structured qualitative interviews with 40 (full and part-time) employees from two European countries were conducted. **Results:** The study with employees from Austria and Germany (n = 40) confirmed that employees have started to recognize the potential of the workplace as an environment, where individual health can be enhanced. Yet, the results showed that only a few companies have already put some WPHP measures into practice. Likewise, the implementation of healthy leadership is rather limited to date. **Conclusions:** At present, companies are still more likely to delegate responsibility for employee health and well-being to their staff, having not fully realized the potential of healthy leadership and organizational health promotion. There is great potential to increase WPHP measures on the employer side, through both healthy leadership and supporting WPHP measures.

Koinig et al. 2021.

International Journal of Environmental Medicine and Public Health, vol. 18, no. 17.

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Keywords: Healthy leadership; Organizational health; Qualitative study; Workplace health promotion.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/17/9260>

Enablers and barriers to effective clinical supervision in the workplace: a rapid evidence review

Objectives: We aimed to review the international literature to understand the enablers of and barriers to effective clinical supervision in the workplace and identify the benefits of effective clinical supervision.

Design: A rapid evidence review. **Data sources:** Five databases (CINAHL, OVID Embase, OVID Medline, OVID PsycInfo and ProQuest) were searched to ensure inclusion and breadth of healthcare professionals.

Eligibility criteria: Studies identifying enablers and barriers to effective clinical supervision across healthcare professionals in a Western context between 1 January 2009 and 12 March 2019. **Data**

extraction and synthesis: An extraction framework with a detailed inclusion/exclusion criteria to ensure

rigour was used to extract data. Data were analysed using a thematic qualitative synthesis. These themes were used to answer the research objectives. **Results:** The search identified 15 922 papers, reduced to 809 papers following the removal of duplicates and papers outside the inclusion criteria, with 135 papers being included in the full review. Enablers identified included regular supervision, occurs within protected time, in a private space and delivered flexibly. Additional enablers included supervisees being offered a choice of supervisor; supervision based on mutual trust and a positive relationship; a cultural understanding between supervisor and supervisee; a shared understanding of the purpose of supervision, based on individual needs, focused on enhancing knowledge and skills; training and feedback being provided for supervisors; and use of a mixed supervisor model, delivered by several supervisors, or by those trained to manage the overlapping (and potentially conflicting) needs of the individual and the service. Barriers included a lack of time, space and trust. A lack of shared understanding to the purpose of the supervision, and a lack of ongoing support and engagement from leadership and organisations were also found to be barriers to effective clinical supervision. **Conclusions:** This review identified several enablers of and barriers to effective clinical supervision and the subsequent benefits of effective clinical supervision in a healthcare setting.

Rothwell et al. 2021.

BMJ Open, vol. 11, no. 9.

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Keywords: Education & training (see medical education & training); Health services administration & management; Organisation of health services; Organisational development; Quality in healthcare.

Evidence Level: 6A

Link: <https://bmjopen.bmj.com/content/11/9/e052929.long>

Relationship of leadership and envy: How to resolve workplace envy with leadership - A bibliometric review study

In recent years, workplace envy has gradually become a hot research topic for organizational behavior. Scholars have explored the antecedents and consequences of envy following the traditional research paradigm. The latest leadership theory also provides new ideas for its development. Although the traditional methods continue to optimize the research on the relationship between leadership and envy, they still do not fully reflect the binary logical relationship between the two and cannot offer sufficient explanatory power for the psychological activities and behaviors of employees and supervisors. In this paper, two pieces of bibliometric software, CiteSpace (American, Drexel University) and Histcite (American, Clarivate Analytics), were used in order to analyze the previous literature in regard to providing a theoretical basis, the main content, and the stages of development. Based on the integration, we propose a dual-track theoretical model of leadership and envy as the prediction framework for future research. The research has returned to the intelligent attribute of leadership and believes that effective leadership can adjust the existence of various types of envy and transform it into the actual productivity of the workplace.

Liu et al. 2021.

Journal of Intelligence, vol. 9, no. 3.

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Keywords: Bibliometric review; Binary relationship; Dual-track theoretical model; Envy; Leadership.

Evidence Level: 5B

Link: <https://www.mdpi.com/2079-3200/9/3/44>

Work Ability

Exploring the factors that influence workforce participation for people with Multiple Sclerosis: A discrete choice experiment

Purpose: Research indicates that employment is beneficial for people with multiple sclerosis (MS). However, people with MS typically face reduced workforce participation compared to the general population. Using a discrete choice experiment (DCE) we explored which factors are most important in influencing employment choices of people with MS, and whether the relative importance of factors differs between subgroups. **Methods:** Attributes and levels for the DCE were developed using a systematic

literature review and public involvement techniques with people with MS. In an online survey, respondents were asked to choose between two hypothetical job scenarios described using six attributes. We used a large, national register (the UK MS Register), to recruit participants aged 18-64 years with a diagnosis of MS. Choice data were analysed using multinomial logit and latent class models. **Results:** Analyses were based on responses from 2350 people with MS. The preferred model specification was a latent class model, with three classes of respondent. The relative importance of attributes varied between classes, with one giving the greatest weight to the impact of work on other aspects of their lives, the second to having supportive bosses and colleagues, and the third to job flexibility. The classes differed significantly in terms of age and gender, type of MS, and socio-economic status. **Conclusions:** Significant heterogeneity was apparent among people with MS regarding the factors that influence their employment decisions. Attributes concerning the impact of work, attitudes in the workplace and job flexibility appear more influential than those concerning physical workplace adaptations.

Goodwin et al. 2021.

Journal of Occupational Rehabilitation, vol. 31, no. 3.

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Keywords: Employment; Multiple sclerosis; Surveys and questionnaires.

Evidence Level: 5A

Link: <https://link.springer.com/article/10.1007%2Fs10926-020-09952-5>

The contribution of employer characteristics to continued employment of employees with residual work capacity: evidence from register data in The Netherlands

Objectives: This study aimed to examine the contribution of employer characteristics to continued employment of employees with residual work capacity. Moreover, we examined whether the contribution of employer characteristics differs across types of employers and employees' types of diseases. **Methods:** Register data on disability assessments and employment status of N=84 394 long-term sick-listed employees with residual work capacity were obtained from the Dutch Employee Insurance Agency between 2010 and 2017. The dependent variable was continued employment four months after the assessment. We linked employees to their (former) employer to measure sector, firm size, and workforce composition. The average employment outcome of all employees assessed in the same firm and year served as a proxy measure for the extent of implemented disability-related policies and practices. Using multilevel multiple regression analysis, we compared the relative contribution of employer characteristics with employees' characteristics. **Results:** Employer characteristics accounted for 10% of the variability in employment outcomes. In comparison, employees' socio-demographic and disease characteristics accounted for 13% of the variability. The prevalence of continued employment was lowest in smaller firms and construction and low-wage service-orientated sectors. Furthermore, there were sizeable differences in employment outcomes between similar employers in terms of size, sector and workforce-composition, particularly between larger firms and among employees with mental or musculoskeletal disorders compared to other diseases. **Conclusions:** This study shows substantial differences between employers in facilitating continued employment of employees with residual work capacity. Encouraging firms to invest more in disability-related policies and practices may result in better employment opportunities for these employees.

van Ooijen et al. 2021.

Scandinavian Journal of Work, Environment and Health, vol. 47, no. 6.

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Keywords: Employer characteristics; Residual work capacity.

Evidence Level: 5B

Link: <https://www.sjweh.fi/article/3961>

Adapting to the Future of Work

Aging Workforce

Do older manual workers benefit in vitality after retirement? Findings from a 3-year follow-up panel study

Vitality is the feeling of physical and mental aliveness. Vitality benefits individual, organizational and societal well-being. However, we know much less about the dynamics in the levels of vitality and its' precursors. This study investigates the effects of retirement on vitality and how this effect differs between manual and non-manual workers and by baseline levels of vitality. We used two waves of the NIDI Pension Panel Survey, collected in the Netherlands in 2015 and 2018. Data from 4156 older workers (N = 4156), of whom 1934 (46.5%) retired between waves, were analysed. Vitality is assessed in three ways, as: (1) a composite measure of vitality, and its subcomponents (2) energy and (3) fatigue. Conditional Change OLS Regression models demonstrated that retirement is associated with improved vitality and decreased fatigue. Older workers who retire from manual work at wave 1 experienced the largest gains in vitality and highest declines in fatigue at wave 2, compared to those who remained employed. Retirement was more advantageous for older workers who experienced poor vitality and high fatigue at wave 1. No such effects were found for energy. Older workers in manual work, those experiencing low vitality and high fatigue at wave 1, may benefit most from early retirement. Since opportunities for early retirement are highly restrictive, it is essential to provide these groups of workers with effective work accommodations and interventions that may not only improve their vitality and quality of working life, but also extend their participation in the labour market.

Vanajan et al. 2021.

European Journal of Ageing, vol. 18, no. 3.

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Keywords: Health; Liveliness; Physical labour; Well-being.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs10433-020-00590-7>

Metabolic syndrome incidence in an aging workforce: Occupational differences and the role of health behaviors

This study investigates whether the incidence of metabolic syndrome (MetS), and its components, differs by occupational group among older workers (45-65 years) and whether health behaviors (smoking, leisure-time physical activity, diet quality, and alcohol consumption) can explain these differences. A sample of older workers (N = 34,834) from the North of the Netherlands was investigated. We analyzed data from two comprehensive measurement waves of the Lifelines Cohort Study and Biobank. MetS components were determined by physical measurements, blood markers, medication use, and self-reports.

Occupational group and health behaviors were assessed by questionnaires. The association between occupational groups and MetS incidence was examined using logistic regression analysis. Health behaviors were subsequently added to the model to examine whether they can explain differences in MetS incidence between occupational groups. Low skilled white-collar (OR: 1.24; 95 % CI: 1.12, 1.37) and low skilled blue-collar (OR: 1.37; 95 % CI: 1.18, 1.59) workers had a significantly higher MetS incidence risk than high skilled white-collar workers. Similar occupational differences were observed on MetS component level.

Combinations of unhealthy behaviors were more prevalent among blue-collar workers. MetS incidence in older workers differs between occupational groups and health behaviors explain a substantial part of these differences. Health promotion tailored to occupational groups may be beneficial specifically among older low skilled blue-collar workers. Research into other factors that contribute to occupational differences is needed as well as studies spanning the entire working life course.

Runge et al. 2021.

SSM Population Health, vol. 28.

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Keywords: Endocrinology; Lifestyle factors; Occupation; Older workers.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S2352827321001567?via%3Dihub>

Technology

Longer-term effectiveness of eLearning and blended delivery of Mental Health First Aid training in the workplace: 2-Year follow-up of a randomised controlled trial

Introduction: Evidence relating to long-term outcomes of online education programs is largely lacking and head-to-head comparisons of different delivery formats are very rare. The aims of the study were to test whether eLearning Mental Health First Aid (MHFA) or blended training (eLearning plus face-to-face course delivery), implemented in an Australian public sector workplace, were more effective than a control intervention at 1-year and 2-year follow-up, and whether blended MHFA training was more effective than eLearning alone. **Material and methods:** Australian public servants ($n = 608$ at baseline) were randomly assigned to complete an eLearning MHFA course, a blended MHFA course or Red Cross eLearning Provide First Aid (PFA) (the control) and completed online questionnaires pre- and post-training and one and two years later ($n = 289$, $n = 272$, $n = 243$ at post, 1- and 2-year follow-up respectively). The questionnaires were based on vignettes describing a person with depression or post-traumatic stress disorder (PTSD). Primary outcomes were mental health first aid knowledge, desire for social distance and quality of support provided to a person in the workplace. Secondary outcomes were recognition of mental health problems, beliefs about treatment, helping intentions and confidence, personal stigma, quality of support provided to a person outside the workplace, self-reported professional help seeking and psychological distress. **Results:** At 1-year follow-up, both eLearning and blended courses produced greater improvements than PFA training in knowledge, confidence and intentions to help a person with depression or PTSD, beliefs about dangerousness and desire for social distance. At 2-year follow-up, some of these improvements were maintained, particularly those relating to knowledge and intentions to help someone with PTSD. When eLearning and blended courses were compared at 1-year follow-up, the blended course led to greater improvements in knowledge and in confidence and intentions to help a person with depression. At 2-year follow-up, improvements in the quality of help provided to a person with a mental health problem outside the workplace were greater in participants in the blended course. **Conclusions:** Both blended and eLearning MHFA courses led to significant longer-term improvements in knowledge, attitudes and intentions to help a person with a mental health problem. Blended MHFA training led to an improvement in the quality of helping behaviours and appears to be more effective than online training alone. Trial registration ACTRN12614000623695 registered on 13/06/2014 (prospectively registered). Trial registry record url: <https://www.anzctr.org.au/Trial/Registration/TrialReview.aspx?id=366410&isReview=true>.

Reavley et al. 2021.

Internet Interventions, vol. 25.

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Keywords: Blended learning; Depression; Mental Health First Aid; Mental health literacy; eLearning.

Evidence Level: 2A

Link: <https://www.sciencedirect.com/science/article/pii/S2214782921000749?via%3Dihub>

Preventing and monitoring work-related diseases in firefighters: A literature review on sensor-based systems and future perspectives in robotic devices

In recent years, the necessity to prevent work-related diseases has led to the use of sensor-based systems to measure important features during working activities. This topic achieved great popularity especially in hazardous and demanding activities such as those required of firefighters. Among feasible sensor systems, wearable sensors revealed their advantages in terms of possibility to conduct measures in real conditions and without influencing the movements of workers. In addition, the advent of robotics can be also exploited in order to reduce work-related disorders. The present literature review aims at providing an overview of sensor-based systems used to monitor physiological and physical parameters in firefighters during real activities, as well as to offer ideas for understanding the potentialities of exoskeletons and assistive devices.

Taborri et al. 2021.

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

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Keywords: Firefighters; Physiological and physical parameters; Robotic devices; Wearable sensors; Work-related disease.

Evidence Level: 6B

Link: <https://www.mdpi.com/1660-4601/18/18/9723>

Digitally connected work and its consequences for strain - a systematic review

Background: Evolving digitization has an impact not only on the organization of work, but also on the health of employees. Dealing with new technologies, integrating new processes and requirements into work, and restructuring tasks among others are demands that can be stressful and impair health.

Objectives: Our aim was to identify (clusters of) working conditions associated with digitally connected work and to analyze their relations with strain, that is, health and well-being outcomes.

Methods: Between May and October 2019, a search string was used to systematically search six databases (EMBASE, Medline, PSYINDEX, PsycInfo, SocIndex, WISO) for German and English texts according to the PEO scheme. The methodological quality was assessed using the Quality Assessment Tool for Studies with Diverse Design. **Results:** 14 studies were identified. Despite the search string containing latest technologies, we identified mostly studies from the 1980s/90s. To aggregate findings, a categorization of work factors (cognitive demands, social factors, organizational factors, environmental factors) and health factors (motivation/satisfaction, reduced well-being/affective symptoms, physiological parameters/somatic complaints) is introduced. The most frequently identified work factors belong to the category of cognitive demands. For health factors, motivation/satisfaction was identified most often. 475 associations were found in total. **Conclusions:** This systematic review provides an overview of work and health factors that have been studied between 1981 and 2019. Recent texts frequently study individualized health factors (e.g., life satisfaction) whereas objective physiological measurement data and objective survey methods such as workplace analysis are not used. This latter approach was predominantly found in the older studies. In order to obtain a comprehensive picture, however, it is worthwhile to use a combination of these subjective and objective approaches for future studies in this field.

Zolg et al. 2021.

Journal of Occupational Medicine and Toxicology, vol. 16, no. 1.

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Keywords: Digitalization; Strain; Systematic review; Work.

Evidence Level: 1A

Link: <https://occup-med.biomedcentral.com/articles/10.1186/s12995-021-00333-z>

Guiding and Supporting Mental Health and Wellbeing

Mental Health

Sick leave and return to work for patients with anxiety and depression: a longitudinal study of trajectories before, during and after work-focused treatment

Objectives: Sick leave due to anxiety and depression is a heterogeneous process constituting a pressing public health issue. This longitudinal study aimed to identify sick leave trajectories among patients before, during and after work-focused treatment, in all 29.5 months. We then aimed to determine the background and clinical characteristics of these trajectory groups. **Methods:** Background and clinical data were collected by patient self-report (N=619) in an observational study in a specialised mental healthcare clinic. Sick leave was recorded from national registry data. A latent growth mixture model identified trajectories. Multinomial logistic regression determined differences in background characteristics while a one-way analysis of variance (ANOVA) identified clinical differences. **Results:** We identified three trajectories: The 'Resilient' group (47.7%) had low sick leave throughout the period. The two other groups ('Recovery', 31.8% and 'High risk', 20.5%) had similar pretreatment trajectories: lower sick leave one year prior which increased to high sick leave at the start of treatment. After treatment, the 'Recovery' group made an almost full return to work while the 'High risk' group remained at high sick leave. The two groups with high sick leave had more women and higher age compared with the 'Resilient' group. All groups had similar

clinical scores at the start of treatment, but the 'High risk' groups had residual depressive symptoms at the end of treatment. Effect sizes for anxiety and depression were moderate or large for all groups, (Cohen's $d=0.74-1.81$), and 87.2% of the total sample were fully working one year after treatment.

Conclusion: We found three subgroups with distinctly different trajectories. Female gender and higher age were associated with high sick leave at the start of treatment, while residual depressive symptoms at the end of treatment predicted continued sick leave. The study points to the possibility of improving patient outcomes in the future by stratifying and tailoring treatment to patient characteristics.

Sandin et al. 2021.

BMJ Open, vol. 11, no. 9.

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Keywords: Anxiety disorders; Depression & mood disorders; Health policy; Mental health; Public health.

Evidence Level: 4A

Link: <https://bmjopen.bmj.com/content/11/9/e046336.long>

Employment status and desire for work in severe mental illness: results from an observational, cross-sectional study

Purpose: People with a severe mental illness (SMI) are at particular risk of occupational exclusion. Among the approaches to occupational rehabilitation, supported employment (SE) has been proven to be the most effective. A requirement to enter SE-programs is that individuals must want to seek competitive employment. The aim of this work is to investigate the relationship between serious mental illness and the desire to work including potential predictors. **Methods:** This is a cross-sectional observational study of patients with SMI aged 18-65 years ($n = 397$). Patients were interviewed by trained staff using standardised instruments. The relationship between potential predictors and a strong preference for employment were analysed using a hierarchic binary logistic regression model. **Results:** Only about one-quarter (27.9%) of SMI patients is in competitive employment. Another quarter is unemployed (25.9%). Results show that the desire for competitive employment is strong among more than half of the SMI patients. Among the unemployed, two-thirds express a strong desire for work. These individuals are an ideal target group for SE interventions. Comorbid chronic physical illness, diagnosis, and the subjectively judged ability to work are associated with the desire for work. **Conclusion:** Our data confirm a substantial exclusion of individuals with SMI from the workforce. In general, care needs for workplace interventions are not being met and leave much room for improvement. In addition to employment status, the desire for work should be routinely assessed.

Gühne et al. 2021.

Social Psychiatry and Psychiatric Epidemiology, vol. 56, no. 9.

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Keywords: Desire to work; Employment status; Predictors; Supported employment; Work ability.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs00127-021-02088-8>

Association between unpredictable work schedules and depressive symptoms in Korea

Backgrounds: Irregular and unpredictable work schedules have become more common in most societies. The purpose of this study was to investigate the association between unpredictable work schedules and depressive symptoms in Korea. **Methods:** Data from 34,486 workers who participated in the Korean Working Condition Survey in 2017 were used. Unpredictable work schedules were measured by questions about the frequency of changes in work schedule and limited advanced notice. Depressive symptoms were assessed by a single item asking if the participants had depressive symptoms over the last 12 months. Multivariable-adjusted logistic regression analysis was used to calculate odds ratios (ORs) for high depressive symptoms. **Results:** The OR for depressive symptoms was significantly higher in the workers with unpredictable work schedules compared to those with predictable work schedules after controlling for age, sex, education, salary, marital status, occupation, contract period, full-time versus part-time, shift work, weekly working hours, and having a child under the age of 18 years (OR = 2.43, 95% confidence interval 1.93-3.07). **Conclusion:** Unpredictable work schedules were associated with depressive symptoms

controlling for the other dimensions of precarious employment in a representative working population in Korea.

Lee et al. 2021.

Safety and Health at Work, vol. 12, no. 3.

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Keywords: Mental health; Overtime; Precarious work; Unpredictability; Work-life conflict.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S2093791121000081?via%3Dihub>

Bullying and Harassment

Sexual and gender harassment in Swedish workplaces: A prospective cohort study on implications for long-term sickness absence

Objectives: This prospective cohort study aimed to investigate gender harassment and sexual harassment as risk factors for prospective long-term sickness absence (LTSA, ≥ 21 days). Furthermore, support from colleagues was investigated as a moderating factor of this association. **Methods:** Information on gender harassment, sexual harassment and support by colleagues were derived from the biannual Swedish Work Environment Survey 1999-2013, a representative sample of the Swedish working population (N=64 297). Information on LTSA as well as demographic and workplace variables were added from register data. Relative rates of LTSA the year following the exposure were determined using modified Poisson regression. **Results:** Monthly to daily exposure to gender harassment was a risk factor for prospective LTSA among women [rate ratio (RR) 1.04, 95% confidence interval (CI) 1.02-1.05] and men (RR 1.07, 95% CI 1.04-1.10). Monthly to daily exposure to sexual harassment was also a risk factor for LTSA among women (RR 1.05, 95% CI 1.01-1.10) and men (RR 1.07, 95% CI 1.02-1.13). Exposure to sexual or gender harassment once in the last 12 months was not associated with LTSA. There was no support for an interaction between either of the exposures and support from colleagues in relation to LTSA. **Conclusions:** Sexual harassment and gender harassment appear to contribute to a small excess risk for LTSA among women and men. For both kinds of offensive behaviors, the pervasiveness appears to be important for the outcome. The role of support by colleagues was inconclusive and needs further investigation.

Blindow et al. 2021.

Scandinavian Journal of Work, Environment and Health, vol. 47, no. 6.

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Keywords: Sexual harassment; Gender harassment; Sickness; Absence; Risk factors.

Evidence Level: 4A

Link: <https://www.sjweh.fi/article/3971>

Exposure to workplace violence and threats and risk of depression: a prospective study

Objectives: Several studies have examined the health consequences of workplace threats and violence, however, due to methodological issues the epidemiological evidence is limited. The purpose of this study was to examine the prospective association between self-labelled exposure to work-related threats and violence and the risk of depression, measured by a standardized psychiatric interview and new prescriptions of anti-depressive medication. **Methods:** Employees were recruited from the Danish PRISME cohort established in 2007 where 4489 Danish public employees answered a postal questionnaire with follow-ups in 2009 and 2011. In all three waves, depression was diagnosed by clinical interviews with the Schedules for Clinical Assessment in Neuropsychiatry (SCAN). In addition, we ascertained prescription of anti-depressive medication from a national register. Using logistic regression and Cox proportional hazard models, we estimated the association between exposure to threats and violence at baseline and SCAN depression and prescription of anti-depressive medication during two years of follow-up. **Results:** Self-labelled exposure to work-related threats and violence was associated with a risk of SCAN diagnosed depression two years later, odds ratios (OR) 2.20 [95% confidence interval (CI) 1.13-4.28] and OR 2.11 (95% CI 1.05-4.24), respectively, with indication of a dose-response. Self-labelled exposure to work-related

threats and violence was associated with prescription of anti-depressive medication in a two-year period, hazard ratios (HR) 2.55 (95% CI 1.47-4.40) and HR 1.47 (95% CI 0.70-3.06), respectively. **Conclusion:** Exposure to work-related threats or violence is associated with an increased risk of depression two years later, measured with a psychiatric interview and register data on prescribed antidepressants.

Rothwell et al. 2021.

Scandinavian Journal of Work and Environmental Health, vol. 3.

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

Keywords: Workplace violence; Depression; Risk; Exposure.

Evidence Level: 4B

Link: <https://www.sjweh.fi/article/3976>

Psychosocial Issues

The relationship among sleep reactivity, job-related stress, and subjective cognitive dysfunction: a cross-sectional study using path analysis

Insomnia, job-related stress, and cognitive dysfunction affect the mental health of workers. However, the relationships among sleep reactivity, job-related stress, and subjective cognitive dysfunction in workers remains not fully understood. Therefore, this study seeks to investigate the relationships among these variables in Japanese adult workers. In total, 536 adult workers in Japan were evaluated using the Japanese version of Ford Insomnia Response to Stress Test, Brief Job Stress Questionnaire, and Cognitive Complaints in Bipolar Disorder Rating Assessment to assess sleep reactivity, job-related stress, and subjective cognitive function, respectively. Path analysis was also carried out. The results of the path analysis showed that sleep reactivity significantly influenced on subjective cognitive dysfunction directly and indirectly via job stressors and stress reaction. Our results may not be generalizable to underage workers because only adult workers were included, which is a limitation of this study. The results of the present study suggest that job-related stress mediates the effect of sleep reactivity on subjective cognitive dysfunction in Japanese adult workers. This underscores the need to evaluate the mediating effect of job-related stress in addressing the subjective cognitive dysfunction associated with insomnia in workers.

Toyoshima et al. 2021.

Industrial Health, vol. 59, no. 4.

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Keywords: Job stress; Mediator; Sleep reactivity; Subjective cognitive function; Workers.

Evidence Level: 4B

Link: https://www.jstage.jst.go.jp/article/indhealth/59/4/59_2020-0251/article

Associations between sleep and work-related cognitive and emotional functioning in police employees

Aim: We aimed to examine the cross-sectional and longitudinal associations between sleep and work-related impaired cognitive and emotional functioning in police employees. **Methods:** This study included 410 participants (52% men) employed in a police district in Norway at baseline, of which 50% also participated in the study at 6 months later follow-up. The questionnaires included items measuring work schedule, sleep length, insomnia, as well as impaired cognitive and emotional functioning at work. **Results:** The results showed that insomnia was related to impaired work-related emotional functioning measured at baseline, and to impaired cognitive functioning measured at both baseline and follow-up. Sleep length and rotating shift work were not associated with future decline in cognitive or emotional functioning.

Conclusion: Our study indicates that the relationship between insomnia and emotional functioning at work may be transient, whereas insomnia can be related to both immediate and future impaired cognitive functioning. Replication of the findings in larger samples is advised. The findings call for an emphasis on the prevention and treatment of sleep problems among police employees as a mean of maintaining and improving cognitive and emotional functioning at work, and thereby reducing the risk for impaired performance and negative health and safety outcomes.

Sørengaard et al. 2021.

Safety and Health at Work, vol. 12, no. 3.

User License: *Creative Commons Attribution -NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)* (<https://creativecommons.org/licenses/by-nc-nd/4.0/>)

Keywords: Cognition; Emotional functioning; Insomnia; Police; Sleep.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S2093791121000317?via%3Dihub>

The chronic health effects of work-related stressors experienced by police communications workers

Background: Law enforcement communications (i.e., 911 dispatch and call takers) is a challenging and stressful occupation. The purpose of this study is to identify the main stressors associated with employment in law enforcement communications, and to identify and provide context to how these stressors affect workers' health and wellbeing. **Methods:** This research study included focus groups with 23 call takers and 911 dispatchers employed by a large, urban law enforcement agency in 2018. Thematic analyses were conducted to identify trends. **Results:** Four themes of stressors emerged (i.e., the high stakes nature of some 911 calls for service, understaffing, supervisor-related stress, and recruiting practice). Two health-related themes emerged as being occupation-related: weight gain and poor sleep patterns/insufficient sleep). Specifically, participants reported negative eating habits resulting in weight gain and obesity, lack of sleep and irregular sleep schedules, and development of hypertension and/or diabetes since beginning their jobs. **Conclusion:** Law enforcement communications professionals experience a number of the same stressors facing law enforcement officers in patrol. These stressors, combined with the sedentary nature of the job, could result in long-term, chronic health problems.

Perez et al. 2021.

Safety and Health at Work, vol. 12, no. 3.

User License: *Creative Commons Attribution -NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0)* (<https://creativecommons.org/licenses/by-nc-nd/4.0/>)

Keywords: 911; Emergency communications; Health; Police; Qualitative.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S2093791121000482?via%3Dihub>

Mindfulness is associated with lower stress and higher work engagement in a large sample of MOOC participants

Objective: This study aimed to understand the associations between mindfulness, perceived stress, and work engagement in a very large sample of English-speaking adults, from 130 different countries. It also aimed to assess participants' self-reported changes following a 6-week mindfulness massive open online course (MOOC). **Methods:** Participants in the 6-week MOOC were invited to complete pre-post online surveys. Cross-sectional associations were assessed using univariate linear models, followed by structural equation models to test mediation pathways in baseline data ($N = 16,697$). Self-reported changes in mindfulness, stress and engagement following training were assessed using paired t -tests ($n = 2,105$). **Results:** Each standard deviation unit increase in mindfulness was associated with a 0.52 standard deviation unit decrease in perceived stress, and with 0.06 standard deviation unit increment in work engagement. 73% of the influence of mindfulness on engagement was direct. Following the mindfulness MOOC, participants reported higher mindfulness ($d = 1.16$), reduced perceived stress ($d = 1.00$) and a small improvement in work engagement ($d = 0.29$). **Conclusions:** Mindfulness was associated with lower perceived stress and higher work engagement in both cross-sectional and longitudinal analyses. These findings support mindfulness as a potentially protective and modifiable personal resource. The MOOC format offers a low cost, highly accessible means for extending the reach and potential benefits of mindfulness training to large numbers of people.

Bartlett et al. 2021.

Frontiers in Psychology, vol. 12.

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Keywords: Meditation; Mindfulness; Online course; Stress; Work engagement.

Evidence Level: 4A

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.724126/full>

Improving the workplace experience of caregiver-employees: A time-series analysis of a workplace intervention

Background: Rapid population aging in developed countries has resulted in the working-age population increasingly being tasked with the provision of informal care. **Methods:** An educational intervention was delivered to 21 carer-employees employed at a Canadian University. Work role function, job security, schedule control, work-family conflict, family work conflict, and supervisor and co-worker support were measured as part of an aggregated workplace experience score. This score was used to measure changes pre/post intervention and at a follow-up period approximately 12 months post intervention. Three random intercept models were created via linear mixed modelling to illustrate changes in participants' workplace experience across time. **Results:** All three models reported statistically significant random and fixed effects intercepts, with a positive coefficient of change. **Conclusion:** This suggests that the intervention demonstrated an improvement of the workplace experience score for participants over time, with the association particularly strong immediately after intervention.

Ding et al. 2021.

Safety and Health at Work, vol. 12, no. 3.

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Keywords: Caregiving; Intervention; Time series; Workplace support; Work-life balance.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S2093791120303656?via%3Dihub>

Associations of working conditions and chronic low-grade inflammation among employees: a systematic review and meta-analysis

Objectives: Chronic low-grade inflammation has been identified as a key pathway linking stress experience to human health. However, systematic evaluations on the relationship of work stress and immune function are scarce and predominantly based on cross-sectional studies. We performed a systematic review and meta-analysis of prospective studies on associations of working conditions and inflammatory biomarkers.

Methods: In line with our previously established study protocol and the PRISMA-guidelines, we systematically searched electronic databases for prospective studies on working conditions as well as workplace interventions and inflammatory markers in employees. We classified studies (by design, type of exposure/intervention, outcome) and performed rigorous risk-of-bias assessments. Studies were summarized qualitatively, and a meta-analysis was conducted. **Results:** We identified 23 eligible studies (N=16 432) with a broad scope of working conditions and inflammatory markers. For interventional designs, we differentiated between individual-directed/behavioral (including physical and mental) and organization-directed/structural interventions. Workplace physical exercise interventions were associated with a decrease in C-reactive protein (k=5; d=-0.61; P<0.001). For other workplace interventions, ie, mental and organizational/structural, results were inconclusive. Concerning observational studies, dimensions of the job demand-control(-support) model were most frequently investigated, and results showed weak - if any - associations with inflammatory markers. **Conclusions:** The research base was heterogeneous and high-level evidence was limited. More prospective studies are needed with broader consideration of work stressors and inflammatory markers. For practical occupational health management, exercise interventions are effective measures to reduce chronic low-grade inflammation.

Kaltenegger et al. 2021.

Scandinavian Journal of Work and Environmental Health, vol. 15.

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Keywords: Working conditions; Low grade inflammation; Employees; Stress.

Evidence Level: 1A

Link: <https://www.sjweh.fi/article/3982>

Changing factors of employee satisfaction with working conditions: An analysis of the Korean working conditions survey

Background: We hypothesized that the growing demand of Korean workers for work-life balance would change the factors influencing job satisfaction. We sought to verify our hypothesis by conducting a conjoint analysis based on the Korean Working Conditions Survey (KWCS). **Methods:** We analyzed the raw data of the KWCS, conducted by the Occupational Safety and Health Research Institute from 2006 to 2017. To complete the analysis, we counted on a conjoint model of analysis, typically used in the analysis of customer satisfaction. The dependent variable was the satisfaction of workers with their working conditions, and the independent variables were the job quality indicators identified by Eurofound. **Results:** The factors that have the greatest impact on working conditions satisfaction are summarized as follows: "physical environment" for the first wave, "adverse social behavior" for the second wave, "occupational status" for the third and fourth waves, and "management quality" for the fifth wave. "Earnings" were not a major factor in determining employee job satisfaction, and the relative importance index is decreasing.

Conclusion: According to the results of the analysis of the tendencies of Korean workers, the factors that affect the satisfaction with the working conditions have changed over time. It is crucial to identify factors that affect working conditions to assure the health and productivity of workers. The results of this study demonstrate that policymakers and employers are required to attentively consider human relations and social environment at work to improve working conditions in the future.

Lee et al. 2021.

Safety and Health at Work, vol. 12, no. 3.

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Keywords: Conjoint analysis; Job quality; Job satisfaction; KWCS; Working conditions.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S2093791121000342?via%3Dihub>

Enabling Healthy and Safe Workplaces

Health and Wellbeing

Occupational lives in sustained recovery from alcohol dependency: An interpretive phenomenological analysis

Alcohol use is a significant risk factor for ill health. Although many people complete treatment, only one third maintain their sobriety. Research has suggested that occupational engagement supports early recovery, but its role in sustained recovery is not known. This study aimed to explore the occupational lives of individuals in sustained recovery from alcohol dependency. An interpretive phenomenological analysis methodology was used, utilizing an occupational perspective. Participants were recruited from a substance use recovery center. Data were collected through interviews and analyzed thematically. This study had three participants. Four themes emerged: (a) shaping occupational lives, (b) shifting coping strategies, (c) finding a gateway to new social connections and a sense of belonging, and (d) establishing a new role in the context of recovery. Findings suggest that in sustained recovery, occupations develop new meanings and purposes that have the potential to support recovery.

Vegeris et al. 2021.

Occupation, Participation and Health, vol. 7

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Keywords: Health; Leisure; Occupation; Qualitative research.

Evidence Level: 5B

Link: <https://journals.sagepub.com/doi/full/10.1177/15394492211042265>

First trimester employment, working conditions and preterm birth: a prospective population-based cohort study

Objectives: To explore the association between working conditions during first trimester and total preterm birth (PTB), and subtypes: spontaneous PTB and iatrogenic PTB, additionally to explore the role of hypertension. **Methods:** Pregnant women from the Amsterdam Born Children and their Development study, filled out a questionnaire between January 2003 and March 2004, two weeks after first prenatal screening (singleton liveborn, n=7561). Working conditions were working hours/week, standing/walking hours/week, physical workload and job strain. **Results:** Prolonged standing/walking during first trimester was associated with an increased risk for total PTB (OR=1.5; 95% CI 1.0-2.3, after adjustments). Other working conditions were not related to total PTB. The separation into spontaneous and iatrogenic PTB revealed that standing/walking was associated with iatrogenic PTB only (OR=2.09; 95% CI 1.00-4.97). The highest risk was found for the combination of a long workweek with high physical workload (OR=3.42; 95% CI 1.04-8.21). Hypertension did not mediate these associations; however, stratified analysis revealed that high physical workload was only related to iatrogenic PTB when pregnancy-induced hypertension was present (OR=6.44; 95% CI 1.21-29.76). **Conclusion:** This study provides evidence that high physically demanding work is associated with an increased risk for iatrogenic PTB and not with spontaneous PTB. Pregnancy-induced hypertension may play a role: when present, high physical workload leads to a more severe outcome.

Vrijkotte et al. 2021.

Occupational and Environmental Medicine, vol. 78, no. 9.

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Keywords: Occupational health; Occupational stress; Pregnancy outcome; Public health; Workload.

Evidence Level: 4A

Link: <https://oem.bmj.com/content/78/9/654.long>

How much does my work affect my health? The relationships between working conditions and health in an Italian survey

Background: Working condition surveys are widely recognized as useful tools for monitoring the quality of working life and the improvements introduced by health and safety policy frameworks at the European and national level. The Italian Workers' Compensation Authority carried out a national survey (Insula) to investigate the employer's perceptions related to working conditions and their impact on health.

Methods: The present study is based on the data collected from the Italian survey on health and safety at work (INSULA) conducted on a representative sample of the Italian workforce ($n = 8,000$). This focuses on the relationship between psychosocial risk factors and self-reported health using a set of logistic and linear regression models. **Results:** Working conditions such as managerial support, job satisfaction, and role act as protective factors on mental and physical health. On the contrary, workers' risk perceptions related to personal exposure to occupational safety and health risks, concern about health conditions, and work-related stress risk exposure determine a poorer state of health. **Conclusions:** This study highlights the link between working conditions and self-report health, and this aims to provide a contribution in the field of health at work. Findings show that working conditions must be object of specific preventive measures to improve the workers' health and well-being.

Ronchetti et al. 2021.

Safety and Health at Work, vol. 12, no. 3.

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Keywords: Occupational safety and health; Psychosocial risks; Self-report health; Working conditions surveys.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S2093791121000330?via%3Dihub>

Occupational position and alcohol use disorders in Poland

Objectives: The following analysis covers the role of the occupational structure in the prevalence of alcohol use disorders (AUDs). The authors investigated whether the occupational position affected the prevalence of AUDs among men and women, and how this relationship varied in lifetime and past year periods.

Material and methods: Data were taken from the General Population Survey on Mental Health in Poland (EZOP) utilizing the Composite International Diagnostic Interview questionnaire (N = 2806). Binary and multiple regression models were employed to assess the risk of AUDs adjusted for the occupational structure and socio-demographic variables. **Results:** The occupational position affects the prevalence of AUDs in men, while it has no impact on AUDs in women. Skilled and non-skilled workers suffer from AUDs to a greater extent than those in higher occupational positions. However, the risk of alcohol harm in women seems to be equally distributed across the occupational structure. **Conclusions:** The uneven pattern of alcohol harm in men and women can be possibly explained by shifting working conditions and work environments, as well as traditional gender roles affecting alcohol behaviors. The findings of the study support further development of the occupational position concept in alcohol research. The problem of harmful alcohol drinking in women across the occupational structure warrants a more in-depth inquiry. *Int J Occup Med Environ Health.* 2021;34(5):591-602.

Buljalski et al. 2021.

International Journal of Occupational Medicine and Environmental Health, vol. 34, no. 5.

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Keywords: Poland; Alcohol; Alcohol use disorders; Gender; Occupational status; Occupational structure.

Evidence Level: 5B

Link: <http://ijomeh.eu/Occupational-position-and-alcohol-use-disorders-in-Poland,131607,0,2.html>

Cardiovascular health research in the workplace: A workshop report

Heart disease and stroke are the first and fifth leading causes of death in the United States, respectively. Employers have a unique opportunity to promote cardiovascular health, because >60% of US adults are employed, and most spend half of their waking hours at work. Despite the scope of the opportunity, <1 in 5 businesses implement evidence-based, comprehensive workplace health programs, policies, and practices. Integrated, systems-based workplace health approaches that harness data science and technology may have the potential to reach more employees and be cost-effective for employers. To evaluate the role of the workplace in promoting cardiovascular health across the lifespan, the National Heart, Lung, and Blood Institute, the National Institute for Occupational Safety and Health, and the American Heart Association convened a workshop on March 7, 2019, to share best practices, and to discuss current evidence and knowledge gaps, practical application, and dissemination of the evidence, and the need for innovation in workplace health research and practice. This report presents the broad themes discussed at the workshop and considerations for promoting worker cardiovascular health, including opportunities for future research.

Calitz et al. 2021.

Journal of the American Heart Association, vol. 10, no. 17.

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Keywords: Total Worker Health; Cardiovascular health; Knowledge gap; Research; Workplace health.

Evidence Level: 6B

Link: <https://www.ahajournals.org/doi/10.1161/JAHA.120.019016>

The impact of work environment on job satisfaction: Pre-COVID research to inform the future

Nursing is challenging work. Burnout, dissatisfaction, disengagement, as well as exodus from the profession are rampant, and COVID-19 has amplified these issues. Although nurse leaders cannot change the work, they can create work environments that support nurse satisfaction, enjoyment, and meaning at work. A literature review on work environment and job satisfaction conducted pre-COVID for a dissertation project revealed several factors that support healthy work environments. This article defines and describes the qualities of both unhealthy and healthy work environments, discusses the impact they have on employees, and offers suggestions for nurse leaders to improve the work environment in their organization.

Donley 2021.

Nurse Leader, vol. 4.

User License: Elsevier Connect COVID-19 resource centre

Keywords: Work environment; Job satisfaction; COVID-19.

Evidence Level: 6A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8416300/>

Working at home and alcohol use

Working at home has become a frequent work arrangement following the COVID-19 pandemic. However, little is known about how working at home influence alcohol use among employees. This study examines associations between working at home at least 15 h per week and alcohol consumption using data from a pre-COVID-19 sample. Self-reported questionnaire data on working at home and alcohol use from a large cross-sectional sample of Norwegian employees (N = 14,728). Data were collected between 2004 and 2019 and were analyzed by ordinal logistic regressions. Working at home for >15 h per week was significantly associated with alcohol use (OR 1.67, 95% CI: 1.30 - 2.16). The association remained significant after adjusting for age, gender, leadership position, and educational level. Working at home may facilitate alcohol use that otherwise would not happen. Organizations must ensure that policies and procedures are in place to prevent alcohol use during working hours among employees working at home.

Nielsen et al. 2021.

Addictive Behaviors Reports, vol. 14

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Keywords: Drinking; Flexible work arrangements; Substance use; Telecommuting; Telework.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S2352853221000407?via%3Dihub>

Work Health and Safety**Promoting the quarry workers' hazard identification through formal and informal safety training**

Background: The surface mining industry has one of the highest fatality rates among private industries in the United States. Despite recent decreases in the fatality rates of comparable industries, the fatality rate in the surface mining industry has increased. Meanwhile, a lack of safety research in surface mining has hindered efforts to improve safety strategies in the surface mining workplace. **Method:** This study examined quarry workers' hazard identification skills by conducting a case study of a surface mining facility in the Mid-Atlantic region of the United States. Semistructured interviews were conducted with eight quarry workers who were employed at the mine facility. In addition to the interviews, data were collected through field notes, notes from an expert meeting with safety managers, and site photographs to explore quarry workers' safety behaviors in the workplace. **Results:** The results showed that quarry workers identified hazards and improved their safety performance by translating safety knowledge learned from training into practice, acquiring hands-on work experience, learning from coworkers, and sharing responsibilities among team members. **Conclusion:** This study contributes to understanding quarry workers' safe performance beyond what they have learned in safety training to include their interaction with other workers and hand-on experience in the workplace. This study informs practitioners in the surface mining industry to build a safe work environment as they design effective safety programs for employees.

Bae et al. 2021.

Safety and Health at Work, vol. 12, no. 3.

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Keywords: Hazard identification; Mine safety; Surface mining; Worker involvement.

Evidence Level: 5A

Link: <https://www.sciencedirect.com/science/article/pii/S2093791121000159?via%3Dihub>

Safety incidents associated with extended working hours. A systematic review and meta-analysis

Objective: We performed a systematic review to assess potential consequences of extended working hours on accidents, near-accidents, safety incidents and injuries (incidents) by considering the overall certainty of evidence. **Methods:** We searched five databases systematically (Medline, Embase, PsycINFO, Web of Science, and Proquest Health and safety Science Abstract) and identified 10072 studies published until December 2020. Twenty-two studies met the inclusion criteria. We followed a systematic approach to evaluate risk of bias and synthesize results in a meta-analysis. The certainty of evidence was determined by a modified version of The Grading of Recommendations Assessment, Development and Evaluation (GRADE). **Results:** Our analyses indicated an association between working >12 hours/day (RR: 1.24, 95%CI: 1.11, 1.40), or working >55 hours/week (RR: 1.24, 95%CI: 0.98, 1.57), and elevated risk of incidents. The certainty of evidence evaluated as low. Weak or no associations were observed for other exposure contrasts: working >8 hours/day (RR: 0.93, 95%CI: 0.72, 1.19), or working overtime (RR: 1.08, 95%CI: 0.75, 1.55), working 41-48 hours/week (RR: 1.02, 95%CI: 0.92, 1.13) or 49-54 hours/week (RR: 1.02, 95%CI: 0.97, 1.07). The certainty of evidence was evaluated as low (very low for 41-48 hours/week). **Conclusions:** Daily working hours >12 hours and weekly working hours exceeding 55 hours was associated and increased risk of incidents. The level of evidence was low. Hence, further high-quality research is warranted to elucidate these associations.

Matre et al. 2021.

Scandinavian Journal of Work and Environmental Health, vol. 47, no. 6.

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Keywords: Safety; Extended working hours; Accidents; Injuries.

Evidence Level: 1A

Link: <https://www.sjweh.fi/article/3958>

Healthy aging requires a healthy home care workforce: the occupational safety and health of home care aides

Purpose of review: To identify important home care (HC) aide occupational safety and health (OSH) hazards and examine how addressing these can improve aide health and the delivery of HC services overall. Specifically, this review seeks to answer: Why is HC aide OSH important? What are the most significant OSH challenges? How can improving HC aide OSH also improve the safety and health of their clients? What implications do the findings have for future research? **Recent findings:** HC is one of the fastest growing US industries. Aides comprise its largest workforce and are increasingly needed to care for the rapidly aging population. There is an aide shortage due in part to instabilities in HC work organization and to serious job-specific hazards, resulting in aides losing work time. Recent social, economic, and technological factors are rapidly changing the nature of HC work, creating OSH hazards similar to those found in nursing homes. At the same time, aides are experiencing social and economic inequities that increase their vulnerability to OSH hazards. These hazards are also a burden on employers who are challenged to recruit, retain, and train aides. OSH injuries and illness interrupt the continuity of care delivery to clients. Many OSH hazards also put HC clients and families at risk. **Summary:** A new framework and methodologies are needed to assess aide and client safety together in order to guide future HC research, policies, and practices. Government, industry, and labor commitment is needed to fund and coordinate a comprehensive, multidisciplinary research program.

Quinn et al. 2021.

Current Environmental Health Reports, vol. 8, no. 3.

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Keywords: Home care; Home care aides; Home health aides; Home health care; Occupational safety and health; Patient safety.

Evidence Level: 6B

Link: <https://link.springer.com/article/10.1007%2Fs40572-021-00315-7>

Evaluation of the HearWell Pilot Program: A participatory Total Worker Health® approach to hearing conservation

Our objective was to pilot test HearWell, an intervention created to preserve hearing among highway maintainers, by using a participatory Total Worker Health® (TWH) approach to designing, implementing and evaluating interventions. Regional maintenance garages were randomized to control (n = 6); HearWell (n = 4) or HearWell Design Team (n = 2) arms. Maintainer representatives from the HearWell Design Team garages identified barriers to hearing health and collaborated to design interventions including a safety leadership training for managers, a noise hazard management scheme to identify noise levels and indicate the hearing protection device (HPD) needed, and a comprehensive HearWell training video and protocol. These worker-designed interventions, after manager input, were delivered to the HearWell Design Team and the HearWell garages. Control garages received standard industry hearing conservation training. Periodic surveys of workers in all 12 garages collected information on the frequency of HPD use and a new hearing climate measure to evaluate changes in behaviors and attitudes over the study period and following interventions. An intention-to-treat approach was utilized; differences and trends in group HPD use and hearing climate were analyzed using a mixed-effects model to account for repeated measures from individual participants. The HearWell Design Team maintainers reported the highest frequency of HPD use. Hearing climate improved in each group 6 months following intervention implementation, with the largest increase and highest value for the HearWell Design Team workers. The HearWell pilot intervention showed promising results in improving HPD use through a participatory TWH approach to hearing conservation. Furthermore, results suggest that employee participation in hearing conservation programs may be necessary for maximal effectiveness.

Cavallari et al. 2021.

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

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Keywords: Total Worker Health; hearing conservation; hearing protection device; safety climate.

Evidence Level: 3A

Link: <https://www.mdpi.com/1660-4601/18/18/9529>

Risk Assessment

Performances of limited area models for the WORKLIMATE Heat-Health Warning System to protect worker's health and productivity in Italy

Outdoor workers are particularly exposed to climate conditions, and in particular, the increase of environmental temperature directly affects their health and productivity. For these reasons, in recent years, heat-health warning systems have been developed for workers generally using heat stress indicators obtained by the combination of meteorological parameters to describe the thermal stress induced by the outdoor environment on the human body. There are several studies on the verification of the parameters predicted by meteorological models, but very few relating to the validation of heat stress indicators. This study aims to verify the performance of two limited area models, with different spatial resolution, potentially applicable in the occupational heat health warning system developed within the WORKLIMATE project for the Italian territory. A comparison between the Wet Bulb Globe Temperature predicted by the models and that obtained by data from 28 weather stations was carried out over about three summer seasons in different daily time slots, using the most common skill of performance. The two meteorological models were overall comparable for much of the Italian explored territory, while major limits have emerged in areas with complex topography. This study demonstrated the applicability of limited area models in occupational heat health warning systems.

Grifoni et al. 2021.

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

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Keywords: Climate change; High-resolution forecasts; Limited area model (LAM); Meteorological model performance; Occupational health and safety; Personalized forecasts for workers; Wet-bulb globe temperature (WBGT).

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/18/9940>

Application of two job indices for general occupational demands in a pooled analysis of case-control studies on lung cancer

Objectives: We investigated general job demands as a risk factor for lung cancer as well as their role in the association between occupational prestige and lung cancer. **Methods:** In 13 case-control studies on lung cancer, as part of the international SYNERGY project, we applied indices for physical (PHI) and psychosocial (PSI) job demands - each with four categories (high to low). We estimated odds ratios (OR) and 95% confidence intervals (CI) for lung cancer by unconditional logistic regression, separately for men and women and adjusted for study centre, age, smoking behavior, and former employment in occupations with potential exposure to carcinogens. Further, we investigated, whether higher risks among men with low occupational prestige (Treiman's Standard International Occupational Prestige Scale) were affected by adjustment for the job indices. **Results:** In 30 355 men and 7371 women, we found increased risks (OR) for lung cancer with high relative to low job demands in both men [PHI 1.74 (95% CI 1.56-1.93), PSI 1.33 (95% CI 1.17-1.51)] and women [PHI 1.62 (95% CI 1.24-2.11), PSI 1.31 (95% CI 1.09-1.56)]. OR for lung cancer among men with low occupational prestige were slightly reduced when adjusting for PHI [low versus high prestige OR from 1.44 (95% CI 1.32-1.58) to 1.30 (95% CI 1.17-1.45)], but not PSI. **Conclusions:** Higher physical job demands were associated with increased risks of lung cancer, while associations for higher psychosocial demands were less strong. In contrast to physical demands, psychosocial demands did not contribute to clarify the association of occupational prestige and lung cancer.

Hovanec et al. 2021.

Scandinavian Journal of Work and Environmental Health, vol. 47, no. 6.

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Keywords: Job demands; Lung cancer; Risk factors.

Evidence Level: 5B

Link: <https://www.sjweh.fi/article/3967>

Chronic Health Issues

Occupational difference in association of poor sleep quality and metabolic syndrome: Differences between workers and employees

Background: Regarding insufficient data about interaction of job in association of sleep quality with metabolic syndrome (MS), this study has been designed to evaluate this association in workers and employees. **Methods:** This cross-sectional study was conducted on 448 municipal staff (employee group: $N = 295$; worker group: $N = 153$) referring for periodic examinations. The relationship between sleep quality and MS and their relevant components was investigated in both groups. **Results:** In the worker group, poor sleep quality was independently associated with the risk of MS by 3.04 times ($P < 0.01$). Among the components of metabolic syndrome, hypertriglyceridemia was associated with a greater number of sleep disorder components. There was no association between metabolic syndrome and sleep quality in the employee group. **Conclusion:** Poor sleep quality exerts different effects on metabolic complications in employees and workers.

Hashemipour et al. 2021.

Sleep Disorders, vol. 17

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Keywords: Poor sleep; Metabolic syndrome; Sleep quality; Workers.

Evidence Level: 4B

Link: <https://www.hindawi.com/journals/sd/2021/9947027/>

Job strain and effort-reward imbalance as risk factors for type 2 diabetes mellitus: A systematic review and meta-analysis of prospective studies

Objectives: This systematic review and meta-analysis aimed to synthesize the available data on prospective associations between work-related stressors and the risk of type 2 diabetes mellitus (T2DM) among adult workers, according to the demand-control-support (DCS) and the effort-reward imbalance (ERI) models.

Method: We searched for prospective studies in PubMed, EMBASE, Web of Science, Scopus, CINHAL and PsychInfo. After screening and extraction, quality of evidence was assessed using the ROBINS-I tool adapted for observational studies. The effect estimates extracted for each cohort were synthesized using random effect models. **Results:** We included 18 studies (reporting data on 25 cohorts) in meta-analyses for job strain, job demands, job control, social support at work and ERI. Workers exposed to job strain had a higher risk of developing T2DM when compared to unexposed workers [pooled rate ratio (RR) 1.16, 95% confidence interval (CI) 1.07-1.26]. This association was robust in several supplementary analyses. For exposed women relative to unexposed women, the RR was 1.35 (95% CI 1.12-1.64). The RR of workers exposed to ERI was 1.24 (95% CI 1.08-1.42) compared to unexposed workers. **Conclusions:** This is the first meta-analysis to find an effect of ERI on the onset of T2DM incidence. It also confirms that job strain increases the incidence of T2DM, especially among women.

Pena-Gralle et al. 2021.

Scandinavian Journal of Work and Environmental Health, vol. 28.

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Keywords: Job strain; Diabetes; Risk factors; Stressors.

Evidence Level: 1A

Link: <https://www.sjweh.fi/article/3987>

Association of managerial position with cardiovascular risk factors: A fixed-effects analysis for Japanese employees

Objectives: Although higher occupational classes have been reported to be associated with better health, researchers do not fully understand whether such associations derive from the position or individual characteristics of the person in that position. We examined the association between being a manager and cardiovascular disease (CVD) risk factors using unique panel data in Japan that annually observed employees' occupational class and health conditions. **Methods:** We analyzed data for 45 888 observations from a Japanese company from 2013 through 2017. The association between being a manager and CVD risk factors (metabolic risks and health-related behaviors) were evaluated using simple pooled cross-sectional analyses with adjustment for age, sex, marital status, and overtime-working hours. We further incorporated employee-level fixed-effects into the models to examine whether the associations were subject to individual time-invariant factors. **Results:** The pooled cross-sectional analyses showed that, compared to non-managers, managers had 2.0 mg/dl lower low density lipoprotein cholesterol (LDL-C) level, 1.4 mmHg-lower systolic blood pressure, and 0.2 kg/m² lower body mass index (BMI). After adjusting for employee-level fixed-effects, being a manager was associated with a significantly 2.2 mg/dl higher LDL-C level. However, the associations between an individual's management status and blood pressure or BMI were not significant. Furthermore, managers were 5.5% less likely to exercise regularly and 6.1% less likely to report sufficient sleep in the fixed-effects models, although the pooled cross-sectional analyses did not demonstrate these significant associations. **Conclusions:** Our findings suggest the necessity of considering these unfavorable health risks associated with being promoted to a manager.

Ikesu et al. 2021.

Scandinavian Journal of Work and Environmental Health, vol. 47, no. 6.

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Keywords: Cardiovascular risk factors; Position; Manager; Employees.

Evidence Level: 5B

Link: <https://www.sjweh.fi/article/3966>

Test@work: evaluation of workplace HIV testing for construction workers using the RE-AIM framework

Background: Community testing for HIV can reach previously untested populations but is rarely offered in workplaces. Targeting the construction sector could reach workers from high-risk populations. **Methods:**

The RE-AIM framework was used to evaluate Test@Work, a workplace HIV testing intervention for construction workers implemented at 21 events (10 companies) in the UK. Test@Work had three components: 1) an online health toolkit to inform managers about health screening and HIV testing; 2) general health checks; and 3) opt-in HIV consultation and testing. Quantitative data were collected using registration and exit questionnaires with workers (n = 426) and pre/post-event questionnaires with managers (n = 15), with qualitative analysis of free text responses. **Results:** Reach 426 individuals had health checks. Participants were broadly representative of the UK construction workforce, but with a higher proportion of permanent workers. Most workers reported being in good health but also believed their work had an adverse impact on their health. Effectiveness: 97% of health check participants opted to have a consultation about sexual health (n = 413) and 82% had an HIV test (n = 348), of whom 78% had not previously been tested. All HIV tests were non-reactive. HIV testing at work was considered acceptable by most participants. Participants reported learning new things about their health (74%), said they would make changes as a result (70%) and felt confident of success (median score 8/10). Adoption: Recruitment of companies was challenging and time consuming. Seven of the participating companies were very large, employing over 1000 workers, which is atypical of construction generally. **Implementation:** All events were completed as planned and were considered successful by all parties. Maintenance: All managers would arrange further events if they were offered them. Six managers incorporated sexual health awareness into their health programmes, but this was not possible for many as health agendas were set centrally by their organisations. **Conclusions:** Opt-in HIV testing, when embedded within a general health check, has high uptake and acceptability in the UK construction sector, and reaches individuals at risk for HIV who may not otherwise attend for testing. Cost-effectiveness of this approach is yet to be determined.

Jones et al. 2021.

BMC Public Health, vol. 21, no. 1.

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Keywords: Construction; HIV testing; Health checks; Health promotion; Occupational health; RE-AIM; Workplace.

Evidence Level: 5B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-11739-z>

Occupational Exposure

The prevalence of occupational exposure to noise: A systematic review and meta-analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury

Background: The World Health Organization (WHO) and the International Labour Organization (ILO) are developing joint estimates of the work-related burden of disease and injury (WHO/ILO Joint Estimates), with contributions from a large network of individual experts. Evidence from mechanistic and human data suggests that occupational exposure to noise may cause cardiovascular disease. In this paper, we present a systematic review and meta-analysis of the prevalence of occupational exposure to noise for estimating (if feasible) the number of deaths and disability-adjusted life years from cardiovascular disease that are attributable to exposure to this risk factor, for the development of the WHO/ILO Joint Estimates.

Objectives: We aimed to systematically review and meta-analyse estimates of the prevalence of occupational exposure to noise. **Data sources:** We searched electronic academic databases for potentially relevant records from published and unpublished studies, including Ovid Medline, PubMed, EMBASE, and CISDOC. We also searched electronic grey literature databases, Internet search engines, and organizational websites; hand-searched reference list of previous systematic reviews and included study records; and consulted additional experts. **Study eligibility and criteria:** We included working-age (≥ 15 years) workers in the formal and informal economies in any WHO Member and/or ILO member State, but excluded children (< 15 years) and unpaid domestic workers. We included all study types with an estimate of the prevalence of occupational exposure to noise, categorized into two levels: no (low) occupational exposure to noise (< 85 dBA) and any (high) occupational exposure to noise (≥ 85 dBA). **Study appraisal and synthesis methods:** At least two review authors independently screened titles and abstracts against the eligibility criteria at a first stage and full texts of potentially eligible records at a second stage, followed by extraction of data from

qualifying studies. We combined prevalence estimates using random-effect meta-analysis. Two or more review authors assessed the risk of bias and the quality of evidence, using the RoB-SPEO tool and QoE-SPEO approach developed specifically for the WHO/ILO Joint Estimates. **Results:** Sixty-five studies (56 cross-sectional studies and nine cohort studies) met the inclusion criteria, comprising 157,370 participants (15,369 females) across 28 countries and all six WHO regions (Africa, Americas, Eastern Mediterranean, Europe, South-East Asia, and Western Pacific). For the main analyses, we prioritized the four included studies that surveyed national probability samples of general populations of workers over the 58 studies of workers in industrial sectors and/or occupations with relatively high occupational exposure to noise. The exposure was generally assessed with dosimetry, sound level meter, or official or company records; in the population-based studies, it was assessed with validated questions. Estimates of the prevalence of occupational exposure to noise are presented for all 65 included studies, by country, sex, 5-year age group, industrial sector, and occupation where feasible. The pooled prevalence of any (high) occupational exposure to noise (≥ 85 dBA) among the general population of workers was 0.17 (95% confidence interval 0.16 to 0.19, 4 studies, 108,256 participants, 38 countries, two WHO regions, 12 98%, low quality of evidence). Subgroup analyses showed that pooled prevalence differed substantially by WHO region, sex, industrial sector, and occupation. **Conclusions:** Our systematic review and meta-analysis found that occupational exposure to noise is prevalent among general populations of workers. The current body of evidence is, however, of low quality, due to serious concerns for risk of bias and indirectness. Producing estimates of occupational exposure to noise nevertheless appears evidence-based, and the pooled effect estimates presented in this systematic review are suitable as input data for the WHO/ILO Joint Estimates (if feasible).

Teixeira et al. 2021.

Environment International, vol. 154.

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Keywords: Global burden of disease; Noise; Occupational risk factor; Prevalence; Systematic review.

Evidence Level: 1A

Link: <https://www.sciencedirect.com/science/article/pii/S0160412021000040?via%3Dihub>

Occupational exposure to ultrafine particles in metal additive manufacturing: A qualitative and quantitative risk assessment

Ultrafine particles (UFPs) can be released unintentionally during metal additive manufacturing (AM). Experts agree on the urgent need to increase the knowledge of the emerging risk of exposure to nanoparticles, although different points of view have arisen on how to do so. This article presents a case study conducted on a metal AM facility, focused on studying the exposure to incidental metallic UFP. It intends to serve as a pilot study on the application of different methodologies to manage this occupational risk, using qualitative and quantitative approaches that have been used to study exposure to engineered nanoparticles. Quantitative data were collected using a condensation particle counter (CPC), showing the maximum particle number concentration in manual cleaning tasks. Additionally, scanning electron microscopy (SEM) and energy dispersive X-ray analyzer (EDS) measurements were performed, showing no significant change in the particles' chemical composition, size, or surface (rugosity) after printing. A qualitative approach was fulfilled using Control Banding Nanotool 2.0, which revealed different risk bands depending on the tasks performed. This article culminates in a critical analysis regarding the application of these two approaches in order to manage the occupational risk of exposure to incidental nanoparticles, raising the potential of combining both.

Sousa et al. 2021.

International Journal of Environmental Research and Public Health, vol. 18, no. 17.

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Keywords: Control banding; Exposure; Incidental nanoparticles; Metal additive manufacturing; Occupational exposure; Risk management; Ultrafine particles.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/18/9788>

Occupational noise exposure and incidence of high fasting blood glucose: A 3-Year, multicenter, retrospective study

The role of hazardous occupational noise exposure on the development of prediabetes is not well researched. We aimed to elucidate exposure to hazardous occupational noise as an independent risk factor for high fasting blood glucose (FBG). Participants exposed/non-exposed to occupational noise were recruited from the Common Data Model cohorts of 2013/2014 from two centers and were followed-up for 3 years. Multivariate time-dependent Cox proportional hazard models were used to estimate hazard ratios (HRs) and 95% confidence intervals (CIs) and were adjusted for various covariates. Pooled HRs were calculated. Among the 43,858 participants of this retrospective cohort study, 37.64% developed high FBG. The mean (standard deviation) age in the cohort was 40.91 (9.71) years. In the fully adjusted models, the HRs of high FBG in the two centers were 1.35 (95% CI: 1.24-1.48) and 1.22 (95% CI: 1.17-1.28), and the pooled HR was 1.28 (95% CI: 1.16-1.41). A Kaplan-Meier plot of high FBG incidence by occupational noise exposure showed significant results ($p < 0.001$). We found that occupational noise exposure is significantly associated with high FBG. Preventing exposure to hazardous noise in the work environment may help reduce the risk for prediabetes among workers.

Kim et al. 2021.

International Journal of Environmental Medicine and Public Health, vol. 18, no. 17.

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Keywords: Common Data Model; Fasting blood glucose; Occupational noise; Workers' health examination.

Evidence Level: 4A

Link: <https://www.mdpi.com/1660-4601/18/17/9388>

The effects of genetic polymorphisms on benzene-exposed workers: A systematic review

Background and aims: Benzene is a group I carcinogen, which has been associated with leukemia and myelodysplastic syndrome. Moreover, it has been proposed that polymorphisms in benzene metabolizing genes influence the outcomes of benzene exposure in the human body. This systematic review aims to elucidate the existent relationship between genetic polymorphisms and the risk of developing adverse health effects in benzene-exposed workers. **Methods:** Three databases were systematically searched until April 2020. The preferred reporting items for systematic reviews and meta-analyses method was used to select articles published between 2005 and 2020. Quality assessment and risk of bias were evaluated by the Newcastle-Ottawa scale. **Results:** After full-text evaluation, 36 articles remained out of 645 initially screened. The most studied health effects within the reviewed papers were chronic benzene poisoning, hematotoxicity, altered urinary biomarkers of exposure, micronucleus/chromosomal aberrations, and gene methylation. Furthermore, some polymorphisms on *NQO1*, *GSTT1*, *GSTM1*, *MPO*, and *CYP2E1*, among other genes, showed a statistically significant relationship with an increased risk of developing at least one of these effects on benzene-exposed workers. However, there was no consensus among the reviewed papers on which specific polymorphisms were the ones associated with the adverse health-related outcomes, except for the *NQO1* rs1800566 and the *GSTT1* null genotypes. Additionally, the smoking habit was identified as a confounder, demonstrating worse health outcomes in exposed workers that smoked.

Conclusion: Though there is a positive relationship between genetic polymorphisms and detrimental health outcomes for benzene-exposed workers, broader benzene-exposed cohorts that take into account the genetic diversity of the population are needed in order to determine which specific polymorphisms incur in health risks.

Ramírez-Lopera et al. 2021.

Health Science Reports, vol. 4, no. 3.

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Keywords: Benzene; Chronic benzene poisoning; Genetic polymorphisms; Hematotoxicity; Occupational health.

Evidence Level: 1A

Link: <https://onlinelibrary.wiley.com/doi/10.1002/hsr2.327>

Insecticide exposure and risk of asthmatic symptoms: A systematic review and meta-analysis

The incidence of respiratory disease is increasing. In relation to this, in addition to infection, factors associated with working with chemical insecticides are a cause for concern. Some of the chemicals involved have been shown to affect the respiratory system, and consequentially workers are at increased risk of conditions such as asthma. However, medical opinion around this area is still controversial; therefore, the objective of this study is to investigate the association between exposure to insecticides and asthma by means of a systematic review of the relevant literature. Relevant literature was identified, and a systematic review was conducted to investigate the association between exposure to insecticides and asthma. A total of five studies (three cross sectional and two cohort) including 45,435 subjects were identified as relevant. The summary odds ratios related to the impact of exposure to specific insecticides on asthma were organophosphates 1.31 (95%CI = 1.17-1.48, I² = 27%, p = 0.172), carbamates 1.44 (95%CI 1.08-1.92, I² = 56.7%, p = 0.031) and organochlorines 1.31 (95%CI 1.19-1.64, I² = 37.3%, p = 0.131). Farmers exposed to certain insecticides may have an increased risk of asthma and asthmatic symptoms, but further research on that issue is urgently needed.

Chittrakul et al. 2021.

Toxics, vol. 9, no. 9

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Keywords: Asthmatic symptoms; Farmer; Insecticide.

Evidence Level: 1A

Link: <https://www.mdpi.com/2305-6304/9/9/228>

Occupational exposure to particles and increased risk of developing chronic obstructive pulmonary disease (COPD): A population-based cohort study in Stockholm, Sweden

Objectives: Chronic Obstructive Pulmonary Disease (COPD) is a common respiratory disorder. Next to tobacco smoking, occupational exposure is the most important risk factor for COPD in high-income countries. To enable preventative measures, more knowledge is needed on which specific occupational exposures that are related to risk of developing COPD in men and women. **Methods:** A population-based cohort was formed from subjects responding to the Stockholm Public Health Surveys in 2002, 2006, and 2010, followed up until 2014. The dataset was linked to a quantitative job exposure matrix via occupational titles from the 1990 nation-wide Population and housing census. We identified COPD among subjects having medication for COPD and/or reporting a physician's diagnosis of COPD. The gender-specific risks to develop COPD from occupational particle-exposure were estimated by proportional hazards regression model, adjusted for age and individual data on tobacco-smoking. **Results:** Men exposed to respirable crystalline silica (RCS) (HR 1.46, CI 1.13-1.90), gypsum and insulation material (HR 1.56, CI 1.18-2.05), diesel exhaust (HR 1.18, CI 0.99-1.41) and high levels of particles from asphalt/bitumen (HR 1.71, CI 1.06-2.76) as well as welding fumes (HR 1.57, CI 1.12-2.21) had an increased smoking-adjusted risk for developing COPD. An increased risk was also observed among women highly exposed to various organic particles from soil, leather, plastic, soot, animal, textile, flour (HR 1.53, CI 1.15-2.04). Furthermore, a significant positive exposure-response trend was found among men exposed to RCS, iron dust, gypsum and insulation material, and diesel exhaust. A tendency towards an exposure-response relationship was also seen among both men and women exposed to welding fumes and various organic particles, and among men exposed to particles from asphalt/bitumen. The population attributable fraction for COPD from occupational exposure to particles was 10.6% among men and 6.1% among women. **Conclusions:** This study indicates an increased smoking-adjusted risk of developing of COPD due to occupational exposure to particles. A positive exposure-response relationship was found for RCS, gypsum and insulation, diesel exhaust, and welding fumes. Also, exposure to high levels of asphalt/bitumen and various organic particles was associated with a higher risk for COPD. Reduction of these exposures in the work environment are important to prevent future cases of COPD. More studies are needed to investigate exposure-response relationships further, but this study indicates that the European occupational exposure limit (OEL) for RCS needs to be re-evaluated.

Grahn et al. 2021.

Environmental Research, vol. 200.

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Keywords: Chronic obstructive pulmonary disease; Dust; Epidemiology; Job exposure matrix; Occupational exposure.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S0013935121010331?via%3Dihub>

Review and improvement of chemical hazard risk management of Korean occupational safety and health agency

In 2012, the Korean Occupational Safety and Health Agency developed Chemical Hazard Risk Management (CHARM) as a risk assessment tool. This study aims to reorganize the CHARM technique by complementing its logical loopholes, while evaluating the risk to enterprises and verifying this technique by applying it to some enterprises in Korea. The optimized technique changed the method of quantitative assessment and evaluation criteria, matched the risk level with the required control level, and specified the use of control practice. For the target enterprises, for several assessment methods, risk levels, hazard bands, exposure bands, and the risk assessment results were derived, and the same types of options were compared. Fewer informational methods resulted in more conservative results of risk levels and hazard bands. Since the control status of the enterprises could not be confirmed and the substances handled at the target enterprises were limited in this study, a follow-up study should be performed with more target materials and additional information on the current control status of the enterprises.

Shin et al. 2021.

International Journal of Environmental Research and Public Health, vol. 18, no. 17.

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Keywords: CHARM; COSHH Essentials; Control banding; Permissible exposure limit; Risk assessment.

Evidence Level: 6B

Link: <https://www.mdpi.com/1660-4601/18/17/9395>

Occupational exposures to organic solvents and asthma symptoms in the CONSTANCES cohort

Solvents are used in many workplaces and may be airway irritants but few studies have examined their association with asthma. We studied this question in CONSTANCES (cohort of 'CONSultANTs des Centres d'Examens de Santé'), a large French cohort. Current asthma and asthma symptom scores were defined by participant-reported respiratory symptoms, asthma medication or attacks, and the sum of 5 symptoms, in the past 12 months, respectively. Lifetime exposures to 5 organic solvents, paints and inks were assessed by questionnaire and a population-based Job-Exposure Matrix (JEM). Cross-sectional associations between exposures and outcomes were evaluated by gender using logistic and negative binomial regressions adjusted for age, smoking habits and body mass index. Analyses included 115,757 adults (54% women, mean age 47 years, 9% current asthma). Self-reported exposure to ≥ 1 solvent was significantly associated with current asthma in men and women, whereas using the JEM, a significant association was observed only in women. Significant associations between exposures to ≥ 1 solvent and asthma symptom score were observed for both self-report (mean score ratio, 95%CI, women: 1.36, 1.31-1.42; men: 1.34, 1.30-1.40) and JEM (women: 1.10, 1.07-1.15; men: 1.14, 1.09-1.18). Exposure to specific solvents was significantly associated with higher asthma symptom score. Occupational exposure to solvents should be systematically sought when caring for asthma.

Sit et al. 2021.

International Journal of Environmental Research and Public Health, vol. 18, no. 17.

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Keywords: Asthma symptom score; Current asthma; Job-exposure matrix; Occupational exposure; Population-based cohort; Solvents.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/18/17/9258>

Sedentary Practices

Rise and recharge: Exploring employee perceptions of and contextual factors influencing an individual-level e-health smartphone intervention to reduce office workers' sedentary time at work

This feasibility study explored the contextual factors influencing office workers' adherence to an e-health intervention targeting total and prolonged sedentary time over 12 weeks. A three-arm quasi-randomized intervention included prompts at 30 or 60 min intervals delivered via a smartphone application, and a no-prompt comparison arm. Fifty-six office workers completed baseline (64% female) and 44 completed the 12 week follow-up (80% retention). Ecological momentary assessments (EMA) captured contextual data, with 82.8 ± 24.9 EMA prompt questionnaires completed weekly. Two focus groups with $n = 8$ Prompt 30 and 60 participants were conducted one-month post-intervention to address intervention acceptability and feasibility. Contextual findings indicate that when working on a sedentary task (i.e., reading or screen-based work) and located at an individual workstation, hourly prompts may be more acceptable and feasible for promoting a reduction in total and prolonged sedentary time compared to 30 min prompts. Interpersonal support also appears important for promoting subtle shifts in sedentary working practices. This novel study gives a real-time insight into the factors influencing adherence to e-health prompts. Findings identified unique, pragmatic considerations for delivering a workplace e-health intervention, indicating that further research is warranted to optimize the method of intervention delivery prior to evaluation of a large-scale intervention.

Morris et al. 2021.

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

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Keywords: EMA; Feasibility; Intervention; Mobile application; Physical activity; Sedentary behavior; Standing; Workplace.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/18/9627>

Physical Activity

Associations of abnormal sleep duration with occupational and leisure-time physical activity in the working population: A nation-wide population-based study

Background: The present study investigated the association between two domains of physical activity (occupational physical activity [OPA] and leisure-time physical activity [LTPA]) and sleep duration.

Methods: We investigated 3,421 paid workers from the Korea National Health and Nutrition Examination Survey, 2014-2015. Sleep duration was categorized into three categories (short for less than 5 h, optimal for 5-9 h, and long for more than 9 h). OPA and LTPA were defined in terms of answers to relevant questions. Odds ratios were calculated for sleep duration according to each physical activity domain using multinomial logistic regression models. **Results:** There were 464 subjects (13.6%) who showed short sleep duration, and 169 subjects (4.9%) who showed long sleep duration. Prevalence of OPA and LTPA was higher in male workers than in female workers (for OPA: 3.67% and 1.76%, respectively, $p = 0.0108$; for LTPA: 16.14% and 6.07%, respectively, $p < 0.0001$). The odds ratio of OPA for long sleep duration in female workers was 3.35 (95% confidence interval, 1.37-8.21). Otherwise, LTPA was not associated with sleep duration in female paid workers, nor both physical activity domains in male paid workers.

Conclusion: Female paid workers with work-related physical activity were at risk of oversleeping. These findings also suggested that physical activity has distinct associations with sleep duration according to the physical activity domains and sex.

Beak et al. 2021.

Safety and Health at Work, vol. 12, no. 3.

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Keywords: KNHANES; Leisure-time physical activity; Occupational physical activity; Sleep duration.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S2093791121000500?via%3Dihub>

The relationship between readiness to change pain-related exercise participation and perceived work ability: a cross-sectional study of factory workers

Background: Healthy lifestyle behaviours are associated with protection against health disorders and pain. Exercise participation is one such behaviour, associated with improved outcomes in those experiencing pain. Musculoskeletal pain is highly prevalent in the workplace, particularly in factory workers and associated loss of work function is recognised as having a great impact on individuals, society and the economy. A worker's 'readiness to change pain behaviour' is an important factor to consider in achieving a healthy lifestyle behaviour and potentially improved function. This study aimed to examine the relationship between a cohort of factory workers 'readiness to change pain behaviour' such as exercise and their 'perceived work ability'. **Methods:** A cross-sectional study design was used to establish the relationship between 'readiness to change pain behaviours' and 'perceived work ability'. The Multidimensional Pain Related Change Questionnaire 2 (MPRCQ2) was used to measure readiness to change various pain behaviours including exercise. The Work Ability Index (WAI) was used to assess 'perceived work ability'. Seventy-five factory workers, aged over 18 (66 male, 9 female) were recruited using convenience sampling between September-November 2019. Correlation and multiple regression were used for statistical analysis. **Results:** Mean WAI, MPRCQ2 and MPRCQ2 exercise component were 41.89 (SD 5.28), 4.26 (SD 1.01) and 4.40 (SD 1.69). MPRCQ2 and MPRCQ2 exercise component were not significant predictors of WAI in factory workers ($F(2, 72) = 2.17, p > 0.001$). There was no significant relationship between MPRCQ2 and WAI ($r_s = .09, p > .05$). However, there was a significant positive relationship between MPRCQ2 exercise component and WAI ($r_s = .23, p < .05$). **Conclusions:** This study suggests that readiness to change pain-related exercise participation has a positive association with 'perceived work ability'. Further research should explore the causal relationship and consider strength training as a specific type of exercise.

Shawcross et al. 2021.

BMC Musculoskeletal Disorders, vol. 22, no. 1.

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

Keywords: Exercise; Health; Lifestyle; Pain; Work.

Evidence Level: 4A

Link: <https://pubmed.ncbi.nlm.nih.gov/34488707/>

Musculoskeletal Health

Musculoskeletal symptoms and their associated risk factors among Saudi office workers: a cross-sectional study

Background: Musculoskeletal disorders are common worldwide. Several factors are suggested in their aetiology, one of which is ergonomics alongside other individual factors. This study aims at investigating the prevalence of musculoskeletal disorders among administrative office workers at a large university in Saudi Arabia. **Methods:** This cross-sectional study recruited office workers at a Saudi university. A questionnaire was used that involved three sections, the first section consisted of sociodemographic questions, the second included the Rapid Office Strain Assessment (ROSA) checklist to assess ergonomic factors possibly involved, and the third included the Nordic Musculoskeletal Questionnaire to measure the outcome. Bivariate analyses were performed by Chi-Squared tests and T-tests where appropriate, and a multivariable logistic regression was done to yield odds ratios (OR) and 95% confidence intervals (CIs). **Results:** The prevalence of musculoskeletal symptoms in any region during the past 12 months preceding the study was 84.5%, and only 30% have sought medical advice. The most common area of complaint was the lower back (54.5%). After adjustment, age and years of experience were positively associated with musculoskeletal symptoms (OR = 1.04, 95% CI = 1.01-1.09 and OR = 1.10, 95% CI = 1.05-1.15). Normal weight was associated with a significant reduction in risk (OR = 0.10, 95% CI = 0.05-0.18). ROSA score was an independent risk factor (OR = 1.77, 95% CI = 1.05-2.96).

Conclusions: Musculoskeletal symptoms were highly prevalent in the current sample. Identified predictors may support the need for interventions to reduce risk.

Alomar et al. 2021.

BMC Musculoskeletal Disorders, vol. 22, no. 1.

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

Keywords: Musculoskeletal disorders; Office-workers; Prevalence; Rapid office strain assessment.

Evidence Level: 4B

Link: <https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/s12891-021-04652-4>

Kinematic analysis of movement impaired by generalization of fear of movement-related pain in workers with low back pain

Purpose: To identify impaired trunk movement during work-related activity in individuals with low back pain (LBP) and investigate whether abnormalities were caused by generalized fear of movement-related pain. **Methods:** This cross-sectional study was conducted at a hospital in Japan. We recruited 35 participants with LBP (LBP group; 26 males, 9 females) and 20 healthy controls (HC group) via posters at our hospital. The task required lifting an object. We used a 3D motion capture system to calculate the peak angular velocity of trunk flexion and extension during a lifting task. Pain-related factors for the LBP group were assessed using the visual analogue scale (VAS) for pain intensity over the past 4 weeks and during the task, the Tampa Scale for Kinesiophobia (TSK), the Pain Catastrophizing Scale (PCS), and the Pain Anxiety Symptoms Scale-20 (PASS-20). We compared kinematic variables between groups with a generalized linear mixed model and investigated the relationship between kinematic variables, VAS scores, and psychological factors by performing a mediation analysis. **Results:** The peak angular velocity of trunk extension showed significant main effects on the group factors (LBP group vs. HC group) and their interactions; the value of the kinematic variable was lower at Trial 1 in the LBP group. No LBP participant reported pain during the experiment. The mediation analysis revealed that the relationship between the VAS score for pain intensity over the past 4 weeks and the peak angular velocity of trunk extension in the first trial was completely mediated by the TSK (complete mediation model, 95% bootstrapped CI: 0.07-0.56). **Conclusion:** Individuals with LBP had reduced trunk extension during a lifting task. Generalized fear of movement-related pain may contribute to such impaired trunk movement. Our findings suggest that intervention to ameliorate fear of movement may be needed to improve LBP-associated disability.

Fujii et al. 2021.

PLoS One, vol. 16, no. 9.

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Keywords: Low back pain; Fear; Movement-related pain; Kinematic analysis.

Evidence Level: 4B

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0257231>

Prevalence of work-related musculoskeletal disorders: Psychological and physical risk factors

Purpose-This study aimed to estimate the prevalence and risk factors of MSD pain in various anatomical regions among nurses. **Method-**A cross-sectional study involving a self-administered questionnaire by registered nurses with clinical experience. Data was collected using convenience sampling after obtaining informed consent. The results were drawn from a total of 300 nurses. **Results-**The nurses presented with occasional mental exhaustion (44.3%) and often physical exhaustion (44.0%). Almost all (97.3%) the nurses complained of having work-related pain during the last 12 months. Body parts with the most pain were the lower back (86.7%), ankles (86.7%), neck (86.0%), shoulders (85.0%), lower legs (84.7%) and upper back (84.3%). The pain frequency was rated as occasional pain for the neck and upper back, pain was often felt for the rest of the parts. Nurses complained of severe pain in the lower back (19.7%), right shoulder (29.7%) and left shoulder (30.3%). The frequency of having musculoskeletal symptoms in any body region was increased with age, lower education level, female gender, high BMI, job tenure and lifestyle. **Conclusions-**Nurses' WRMSD complaints should be taken seriously to curb further risk and musculoskeletal hazards.

Krishnan et al. 2021.

International Journal of Environmental Medicine and Public Health, vol. 18, no. 17.

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Keywords: Nursing; Physical factors; Prevalence works related musculoskeletal disorders; Psychological risk factors

Evidence Level: 4A

Link: <https://www.mdpi.com/1660-4601/18/17/9361>

Rates, costs, return to work and reoperation following spinal surgery in a workers' compensation cohort in New South Wales, 2010-2018: a cohort study using administrative data

Background: Internationally, elective spinal surgery rates in workers' compensation populations are high, as are reoperation rates, while return-to-work rates following spinal surgery are low. Little information is available from Australia. The aim of this study was to describe the rates, costs, return to work and reoperation following elective spinal surgery in the workers' compensation population in New South Wales (NSW), Australia. **Methods:** This retrospective cohort study used administrative data from the State Insurance Regulatory Authority, the government organisation responsible for regulating and administering workers' compensation insurance in NSW. These data cover all workers' compensation-insured workers in New South Wales (over 3 million workers/year). We identified a cohort of insured workers who underwent elective spinal surgery (fusion or decompression) between January 1, 2010 and December 31, 2018. People who underwent surgery for spinal fracture or dislocation, or who had sustained a traumatic brain injury were excluded. The main outcome measures were annual spinal surgery rates, cost of the surgical episode, cumulative costs (surgical, hospital, medical and physical therapy) to 2 years post-surgery, and reoperation and return-to-work rates 2 years post-surgery. **Results:** There were 9343 eligible claims (39.1 % fusion; 59.9 % decompression); claimants were predominantly male (75 %) with a mean age of 43 (range 18 to 75) years. Spinal surgery rates ranged from 15 to 29 surgeries per 100,000 workers per year, fell from 2011-12 to 2014-15 and rose thereafter. The average cost in Australian dollars for a surgical episode was \$46,000 for a spinal fusion and \$20,000 for a decompression. Two years post-fusion, only 19 % of people had returned to work at full capacity; 39 % after decompression. Nineteen percent of patients underwent additional spinal surgery within 2 years of the index surgery, to a maximum of 5 additional surgeries. **Conclusion:** Rates of workers' compensation-funded spinal surgery did not rise significantly during the study period, but reoperation rates are high and return-to-work rates are low in this population at 2 years post- surgery. In the context of the poor evidence base supporting lumbar fusion surgery, the high cost, increasing rates, and the increased likelihood of poor outcomes in the workers' compensation population, we question the value of this procedure in this setting.

Lewin et al. 2021.

BMC Health Services Research, vol. 21, no. 1.

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Keywords: Cost; Decompression; Elective; Fusion; Outcomes; Reoperation; Return to work; Spinal; Spine; Surgery; Workers' compensation.

Evidence Level: 4A

Link: <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-021-06900-8>

COVID 19

Adapting to the Future of Work

How will mass-vaccination change COVID-19 lockdown requirements in Australia?

Background To prevent future outbreaks of COVID-19, Australia is pursuing a mass-vaccination approach in which a targeted group of the population comprising healthcare workers, aged-care residents and other individuals at increased risk of exposure will receive a highly effective priority vaccine. The rest of the population will instead have access to a less effective vaccine. **Methods** We apply a large-scale agent-based model of COVID-19 in Australia to investigate the possible implications of this hybrid approach to mass-vaccination. The model is calibrated to recent epidemiological and demographic data available in Australia, and accounts for several components of vaccine efficacy. **Findings** Within a feasible range of vaccine efficacy values, our model supports the assertion that complete herd immunity due to vaccination is not likely in the Australian context. For realistic scenarios in which herd immunity is not achieved, we simulate the effects of mass-vaccination on epidemic growth rate, and investigate the requirements of lockdown measures applied to curb subsequent outbreaks. In our simulations, Australia's vaccination strategy can

feasibly reduce required lockdown intensity and initial epidemic growth rate by 43% and 52%, respectively. The severity of epidemics, as measured by the peak number of daily new cases, decreases by up to two orders of magnitude under plausible mass-vaccination and lockdown strategies. **Interpretation** The study presents a strong argument for a large-scale vaccination campaign in Australia, which would substantially reduce both the intensity of future outbreaks and the stringency of non-pharmaceutical interventions required for their suppression. **Funding** Australian Research Council; National Health and Medical Research Council.

Zachreson et al. 2021.

The Lancet Regional Health West Pacific, vol. 14.

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Keywords: COVID-19; SARS-CoV-2; Agent-based modelling; Computational epidemiology; Epidemic growth rate; Herd immunity; Interventions; Mass vaccination; Pandemics; Vaccine efficacy.

Evidence Level: 6A

Link: [https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065\(21\)00133-4/fulltext](https://www.thelancet.com/journals/lanwpc/article/PIIS2666-6065(21)00133-4/fulltext)

Factors associated with non-essential workplace attendance during the COVID-19 pandemic in the UK in early 2021: evidence from cross-sectional surveys

Objectives: Working from home where possible is important in reducing the spread of COVID-19. In early 2021, a quarter of people in England who believed they could work entirely from home reported attending their workplace. To inform interventions to reduce this, this study examined associated factors. **Study design:** Data from the ongoing COVID-19 Rapid Survey of Adherence to Interventions and Responses survey series of nationally representative samples of people in the UK aged 16+ years in January-February 2021 were used. **Methods:** The study sample was 1422 respondents who reported that they could work completely from home. The outcome measure was self-reported workplace attendance at least once during the preceding week. Factors of interest were analysed in three blocks: 1) sociodemographic variables, 2) variables relating to respondents' circumstances and 3) psychological variables. **Results:** 26.8% (95% confidence interval [CI] = 24.5%-29.1%) of respondents reported having attended their workplace at least once in the preceding week. Sociodemographic variables and living circumstances significantly independently predicted non-essential workplace attendance: male gender (odds ratio [OR] = 1.85, 95% CI = 1.33-2.58); dependent children in the household (OR = 1.65, 95% CI = 1.17-2.32); financial hardship (OR = 1.14, 95% CI = 1.08-1.21); lower socio-economic grade (C2DE; OR = 1.65, 95% CI = 1.19-2.53); working in sectors such as health or social care (OR = 4.18, 95% CI = 2.56-6.81), education and childcare (OR = 2.45, 95% CI = 1.45-4.14) and key public service (OR = 3.78, 95% CI = 1.83-7.81) and having been vaccinated (OR = 2.08, 95% CI = 1.33-3.24). **Conclusions:** Non-essential workplace attendance in the UK in early 2021 during the COVID-19 pandemic was significantly independently associated with a range of sociodemographic variables and personal circumstances. Having been vaccinated, financial hardship, socio-economic grade C2DE, having a dependent child at home and working in certain key sectors were associated with higher likelihood of workplace attendance.

Michie et al. 2021.

Public Health, vol. 108.

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Keywords: COVID-19; Personal circumstances; Sociodemographic variables; Workplace attendance.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0033350621002651?via%3Dihub>

Productivity of working at home and time allocation between paid work, unpaid work and leisure activities during a pandemic

Background and objective: The COVID-19 pandemic and the measures taken by governments to contain it have affected many aspects of the daily lives of citizens. This study aimed to describe changes in the productivity of paid work and time allocation to paid and unpaid work and leisure resulting from working at home during the pandemic. **Methods:** A sample of 851 people from the Netherlands who had paid work (\geq

24 h/week) and worked at least 4 hours per week extra at home because of lockdown measures completed a questionnaire during the first COVID-19 lockdown (April 2020). Respondents reported time spent on paid and unpaid work and leisure before and during the lockdown. Productivity was measured in terms of quantity and quality of paid work. **Results:** On average, respondents spent less time (14%) on paid work and productivity decreased 5.5%. Changes in productivity were associated with the age of children, net income and having a separate home office. Respondents spent more time on unpaid work (27%) and leisure (11%). Women spent more time on unpaid work in absolute but not in relative terms. People with a partner and with children spent more time on unpaid work and less time on leisure.

Conclusions: Productivity of paid work decreased, and people reallocated time between paid and unpaid work and leisure during the first COVID-19 lockdown. Changes in time allocation and productivity differed across subgroups. If working at home becomes more common, future research should focus on the long-term impact on productivity and mental and physical health.

Huls et al. 2021.

PharmacoEconomics, vol. 2.

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Keywords: Working from home; Pandemic; Paid work; Unpaid work; Leisure activities.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs40273-021-01078-7>

COVID-19 vaccination and unemployment risk: lessons from the Italian crisis

This paper analyzes the impact of mobility contraction on employee furlough and excess deaths in Italy during the COVID-19 crisis. Our approach exploits rainfall patterns across Italian administrative regions as a source of exogenous variation in human mobility to pinpoint the causal effect of mobility restrictions on excess deaths and furlough workers. Results confirm that the first countrywide lockdown has effectively curtailed the COVID-19 epidemics restricting it mainly to the northern part of the country, with the drawback of a countrywide increase in unemployment risk. Our analysis points out that a mobility contraction of 1% leads to a mortality reduction of 0.6%, but it induces an increase of 10% in Wage Guarantee Funds allowed hours. We discuss return-to-work policies and prioritizing policies for administering COVID-19 vaccines in the most advanced stage of a vaccination campaign when the healthy active population is left to be vaccinated.

Pironi et al. 2021.

Scientific Reports, vol. 11, no. 1.

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Keywords: COVID-19; Vaccination; Unemployment risk.

Evidence Level: 5B

Link: <https://www.nature.com/articles/s41598-021-97462-6>

Guiding and Supporting Mental Health and Wellbeing

Impact of the COVID-19 pandemic on management-level hotel employees' work behaviors: Moderating effects of working-from-home

This study examines the effects of working-from-home during the COVID-19 pandemic on management-level hotel employees' work engagement, burnout, and turnover intentions. The study demonstrates that working-from-home tends to be a double-edged blade that leads to both positive and negative employee behavioral outcomes. Findings reveal that while working-from-home is associated with a higher level of vigor, it magnifies the effects of absorption on burnout. In addition, due to work-home interference, working-from-home suppresses the positive effect of dedication and amplifies the negative effect of burnout on turnover intentions. The theoretical contributions and managerial recommendations are provided.

Chi et al. 2021.

International Journal of Hospitality Management, vol. 98.

User License: Elsevier Connect COVID-19 resource centre

Keywords: Burnout; COVID-19; Engagement; Hospitality; Managers; Telework; Turnover intentions; Working-from-home.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8412462/>

Social support and perceived uncertainties during COVID-19: Consequences for employees' wellbeing

The COVID-19 crisis has drastically affected organizations worldwide, thereby influencing the employees' psychological wellbeing. Since it is a new pandemic, research is sparse in the domain of employees' psychological wellbeing in relation to the phenomenon. Drawing on social support and job demand-resource perspectives, this research adds to the factors affecting employees' wellbeing due to the coronavirus outbreak. Specifically, this study is an investigation of co-workers' instrumental support in predicting employees' emotional exhaustion via employees' perceived uncertainties experienced due to the COVID-19 pandemic. Further, we tested for the contextual specificity of family support on uncertainties and its link with employees' emotional exhaustion. With data drawn from two universities (n = 275), the findings reveal a negative association between co-worker task support and an employee's emotional exhaustion, and an employee's perceived uncertainties mediate this relationship. Moreover, the moderating analysis exhibits that family support mitigates the negative effect of uncertainty perception on emotional exhaustion. Our study reveals that coworker and family support are extremely important during the COVID-19 pandemic. These findings are equally valuable for organizations and society to mitigate the detrimental effects of the COVID-19 pandemic on employees' wellbeing.

Usman et al. 2021.

Current Psychology, vol. 23, no. 1-2

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Keywords: COVID-19; Emotional exhaustion; JD-R model; Perceived uncertainties; Social support.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8460196/>

The impact of disability on employment and financial security following the outbreak of the 2020 COVID-19 pandemic in the UK

Background: This study compared the short-term impact of the 2020 COVID-19 pandemic and first lockdown on the employment and financial security of UK working age adults with and without disabilities.

The study found that during the first 3 months of lockdown in the UK, workers with disability were more likely to have reduced working hours and higher levels of financial stress.

Emerson et al. 2021.

Journal of Public Health, vol. 43, no. 3.

Keywords: Adults; Disabilities; Socioeconomics factors.

Evidence Level: 5B

Link: <https://academic.oup.com/jpubhealth/article/43/3/472/6082833>

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 reorganization) 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; SMDNon-exposed=0.025, 95% CI 0.014 to 0.036), procedural justice (SMDExposed=0.101, 95% CI 0.084 to 0.118; SMDNon-exposed=0.053, 95% CI 0.038 to 0.068), workplace social capital (SMDExposed=0.094, 95% CI 0.077 to 0.110; SMDNon-exposed=0.034, 95% CI 0.019 to 0.048), less decline in self-rated health

(SMDExposed=-0.038, 95% CI -0.054 to -0.022; SMDNon-exposed=-0.081, 95% CI -0.095 to -0.067), perceived work ability (SMDExposed=-0.091, 95% CI -0.108 to -0.074; SMDNon-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; RRNon-exposed=1.16, 95% CI 1.13 to 1.20). New tasks (6%) were associated with greater increase in psychological distress (RRExposed=1.28, 95% CI 1.19 to 1.39; RRNon-exposed=1.10, 95% CI 1.07 to 1.12) and team reorganization (5%) with slightly steeper decline in perceived work ability (SMDExposed=-0.151, 95% CI -0.203 to -0.098; SMDNon-exposed=-0.124, 95% CI -0.136 to -0.112). **Conclusion:** Employees who worked from home during the pandemic had more favorable psychosocial work environment and health, whereas those who were exposed to work task changes and team reorganizations experienced more adverse changes.

Ervasti et al. 2021.

Occupational and Environmental Medicine, vol. 14

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Keywords: COVID-19; Environment; Occupational health; Occupational stress; Workload.

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8449846/>

The impact of work loss on mental and physical health during the COVID-19 pandemic: Baseline findings from a prospective cohort study

Purpose: To determine if losing work during the COVID-19 pandemic is associated with mental and physical health status. To determine if social interactions and financial resources moderate the relationship between work loss and health. **Methods:** Participants were Australians aged 18 + years that were employed in paid work prior to the COVID-19 pandemic who responded to an online or telephone survey from 27th March to 12th June 2020 as part of a prospective longitudinal cohort study. Outcome measures include Kessler-6 score > 18 indicating high psychological distress, and Short Form 12 (SF-12) mental health or physical health component score ≤ 45 indicating poor mental or physical health. **Results:** The cohort consisted of 2,603 respondents, including groups who had lost their job (N = 541), were not working but remained employed (N = 613), were working less (N = 660), and whose work was unaffected (N = 789). Three groups experiencing work loss had greater odds of high psychological distress (AOR = 2.22-3.66), poor mental (AOR = 1.78-2.27) and physical health (AOR = 2.10-2.12) than the unaffected work group. Poor mental health was more common than poor physical health. The odds of high psychological distress (AOR = 5.43-8.36), poor mental (AOR = 1.92-4.53) and physical health (AOR = 1.93-3.90) were increased in those reporting fewer social interactions or less financial resources. **Conclusion:** Losing work during the COVID-19 pandemic is associated with mental and physical health problems, and this relationship is moderated by social interactions and financial resources. Responses that increase financial security and enhance social connections may alleviate the health impacts of work loss. Registration Australian New Zealand Clinical Trials Registry: ACTRN12620000857909.

Griffiths et al. 2021.

Journal of Occupational Rehabilitation, vol. 31, no. 3.

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Keywords: COVID-19; Employment; Financial support; Mental health; Psychological distress.

Evidence Level: 4A

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-09958-7>

The association of work-related stress according to the demand-control model with aggravation of pre-existing disease during the first state of COVID-19 emergency in Japan

Background: The job environment has changed a lot during the period of coronavirus disease 2019 (COVID-19) pandemic. This study aimed to investigate the association between work-related stress and aggravation of pre-existing disease in workers during the first state of COVID-19 emergency in Japan. **Methods:** Data were obtained from a large internet survey conducted between August 25 and September 30, 2020 in Japan. Participants who reported that they had a job as well as current history of disease(s) (i.e., pre-existing conditions) were included (n=3090). Aggravation of pre-existing disease during the state of

emergency was self-reported. Work-related stress from April 2020 (since the state of COVID-19 emergency) was assessed according to job demand-control model. Multivariable logistic regression models were used to analyze the association. **Results:** Aggravation of pre-existing diseases was reported by 334 participants (11%). The numbers of participants with high demand and low control were 112 (18%) and 100 (14%), respectively. Compared to medium demand, high demand was significantly associated with aggravation of pre-existing diseases (odds ratio: 1.77, 95% confidence interval: 1.30-2.42). Low control compared to medium control was significantly associated with aggravation of pre-existing diseases (odds ratio: 1.39, 95% confidence interval: 1.02-1.92). **Conclusion:** Work-related stress during the first state of COVID-19 emergency was associated with aggravation of pre-existing disease during that period.

He et al. 2021.

Journal of Epidemiology, vol. 18.

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Keywords: COVID-19; Job control; Job demand; Pre-existing disease; Work-related stress.

Evidence Level: 5B

Link: https://www.jstage.jst.go.jp/article/jea/advpub/0/advpub_JE20210146/_article

Effects of depression and resilience of public workers on work-related stress and anxiety in response to the COVID-19 pandemic

Background: This study explored the clinical variables related to public workers' stress and anxiety regarding the viral epidemic, and the mediating effect of resilience on the relationship between their depression and anxiety in response to coronavirus disease 2019 (COVID-19) pandemic. **Methods:** A total of 938 public workers answered anonymous questionnaires in May 2020. The survey included rating scales such as the Stress and Anxiety to Viral Epidemics-9 (SAVE-9), Patients Health Questionnaire-9 (PHQ-9), Generalized Anxiety Disorder-7 (GAD-7), and Connor-Davidson Resilience Scale 2 items (CD-RISC 2), and subjects also answered whether they were employed in COVID-19 related fields. **Results:** Married, female, junior, public workers reported a higher level of stress and anxiety in response to the viral epidemic. Furthermore, high levels of stress and anxiety toward the epidemic are defined by high PHQ-9, high GAD-7, and low CD-RISC 2 scores. It could also be seen that resilience mediated the effect of depression in public workers and their stress and anxiety levels toward the epidemic. **Conclusion:** It is important to reduce the psychological burden of public workers and manage their mental health to help them cope with the epidemic wisely and efficiently. Among many mental health factors, psychological resilience represents an essential target for psychological intervention among public workers.

Ju et al. 2021.

Journal of Korean Medical Science, vol. 36, no. 36.

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Keywords: Anxiety; COVID-19 Resilience; Depression; Public Service.

Evidence Level: 5B

Link: <https://jkms.org/DOIx.php?id=10.3346/jkms.2021.36.e262>

Association of visual display terminal usage with self-rated health and psychological distress among Japanese office workers during the COVID-19 pandemic

The aim of this study was to examine the association of the duration of visual display terminal (VDT) usage for work and non-work activities with self-rated health (SRH) and psychological distress among office workers during the COVID-19 pandemic in Japan. A cross-sectional data of 7088 office workers from a web-based, self-administered survey conducted from 25 August 2020, to 30 September 2020, was used. Multiple logistic regression analysis was applied. Compared to those who used a VDT for 4-9 h for work, office workers who used a VDT for ≥ 10 h for work had poor SRH (odds ratio (OR): 1.65; 95% confidence interval (CI): 1.13, 2.41) and severe psychological distress (OR: 2.23; 95% CI: 1.52, 3.28). VDT usage for less than 1 h (OR: 1.37, 95% CI: 1.12, 1.67) and 1-3 h (OR: 1.42, 95% CI: 1.12, 1.80) for work were also associated with severe psychological distress. Stratification analysis by age showed a significant association of VDT usage for work with poor SRH among 30-64-year-olds, while a U-shape association was found between VDT usage for work and psychological distress with the younger age group (15-29 years old).

During the COVID-19 pandemic in Japan, the prolonged usage of VDT for work can deteriorate both general and psychological health, while moderate usage of VDT for work can reduce psychological distress.

Khin et al. 2021.

International Journal of Environmental Medicine and Public Health, vol. 18, no. 17.

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Keywords: Mental health; Occupational health; Physical health; Screen time; Workplace.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/17/9406>

Enabling Healthy and Safe Workplaces

Personal protective equipment-related occupational dermatoses during COVID-19 among health care workers: A worldwide systematic review

Background: Occupational dermatoses caused by personal protective equipment (PPE) in the ongoing COVID-19 pandemic are emerging occupational health challenges that must be promptly and effectively addressed to ease burden on our health care workers. **Objective:** A systematic review was conducted to determine common PPE-related dermatoses, affected body sites, and implicated occupational contactants. We further proposed solutions to mitigate this problem. **Methods:** Online databases were searched for articles on PPE-related dermatoses in health care workers during the COVID-19 pandemic written in English and published from January 1, 2020, to January 30, 2021. **Results:** Sixteen studies, including a total of 3958 participants, were included. The most common dermatoses were xerosis, pressure-related erythema, and contact dermatitis, mainly affecting the face and hands. The most widely implicated contactants were increased frequency of hand hygiene, gloves, N95 masks, and goggles. Proposed solutions were categorized as individual self-care, protection of the workforce, and long-term preventive measures.

Conclusion: Through measures such as regular basic skin care education, early access to specialty clinics via telemedicine, and designing of better-fit PPE, the challenges posed by PPE-related occupational dermatoses can be significantly reduced.

Keng et al. 2021.

JAAD International, vol. 5.

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Keywords: ACD, Allergic contact dermatitis; COVID-19; HCW, Health care workers; ICD, Irritant contact dermatitis; PPE, Personal protective equipment; Health care workers; Occupational dermatoses; Personal protective equipment.

Evidence Level: 1A

Link: [https://linkinghub.elsevier.com/retrieve/pii/S2666-3287\(21\)00067-5](https://linkinghub.elsevier.com/retrieve/pii/S2666-3287(21)00067-5)

Impact of burnout, secondary traumatic stress and compassion satisfaction on hand hygiene of healthcare workers during the COVID-19 pandemic

Aim: To assess the prevalence of burnout, secondary traumatic stress, and compassion satisfaction and explore their impacts on self-reported hand hygiene among medical aid teams in the COVID-19 period in Wuhan, China. **Design:** Cross-sectional study. **Method:** A total of 1,734 healthcare workers from 17 medical aid teams were surveyed. The survey included burnout, secondary traumatic stress and compassion satisfaction measured by the professional quality of life scale and self-reported hand hygiene. Data were collected between 5-7 March 2020. Multiple regression analyses were performed. **Results:** Burnout and secondary trauma stress were at low and average levels, and compassion satisfaction was at average and high levels. Burnout was negatively associated with hand hygiene, while compassion satisfaction was positively associated. Hospital administrators should pay attention to burnout and compassion satisfaction to improve infection control behaviours. Management of healthcare workers in our study may be constructive in emerging infectious diseases.

Zhou et al. 2021.

Nursing Open, vol. 8, no. 5.

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Keywords: Burnout; Compassion satisfaction; Hand hygiene; Medical aid; Secondary traumatic stress.

Evidence Level: 5B

Link: <https://onlinelibrary.wiley.com/doi/10.1002/nop2.786>

Unequal availability of workplace policy for prevention of coronavirus disease 2019 across occupations and its relationship with personal protection behaviours: a cross-sectional survey

Background: The evolving pandemic of coronavirus disease 2019 (COVID-19) has become a severe threat to public health, and the workplace presents high risks in terms of spreading the disease. Few studies have focused on the relationship between workplace policy and individual behaviours. This study aimed to identify inequalities of workplace policy across occupation groups, examine the relationship of workplace guidelines and measures with employees' behaviours regarding COVID-19 prevention. **Methods:** A cross-sectional online survey using a structured questionnaire was conducted to gather employees' access to workplace guidelines and measures as well as their personal protection behaviours. Statistical associations between these two factors in different occupations were examined using multiple ordinal logistic regressions. **Results:** A total of 1048 valid responses across five occupational groups were analysed. Manual labourers reported lower availability of workplace guidelines and measures (76.9% vs. 89.9% for all, $P = 0.003$). Employees with available workplace guidelines and measures had higher compliance of hand hygiene, wearing masks, and social distancing, and this association was more significant among managers/administrators and manual labourers. **Conclusions:** Protection of the quantity and quality of employment is important. Awareness about the disease and its prevention among employers and administrators should be promoted, and resources should be allocated to publish guidelines and implement measures in the workplace during the pandemic. Both work-from-home arrangement and other policies and responses for those who cannot work from home including guidelines encouraging the health behaviours, information transparency, and provision of infection control materials by employers should be established to reduce inequality. Manual labourers may require specific attention regarding accessibility of relevant information and availability of medical benefits and compensation for income loss due to the sickness, given their poorer experience of workplace policy and the nature of their work. Further studies are needed to test the effectiveness of specific workplace policies on COVID-19 prevention.

Wang et al. 2021.

International Journal for Equity in Health, vol. 20, no. 1.

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Keywords: COVID-19; Occupation; Personal protection behaviour; Prevention; Workplace policy.

Evidence Level: 4A

Link: <https://equityhealthj.biomedcentral.com/articles/10.1186/s12939-021-01527-x>

Occupational health problems and lifestyle changes among novice working-from-home workers amid the COVID-19 pandemic

Background: Social distancing by working-from-home is an effective measure to decrease the spread of COVID-19. However, this new work pattern could also affect the well-being of workers. Therefore, the aim of the study was to study the magnitude of occupational health problems and lifestyle changes among workers who have only recently started working from home. **Methods:** A cross-sectional study was conducted using online self-administered questionnaires during the coronavirus disease 2019 pandemic in the Bangkok metropolitan area, Thailand. The participants were from any organization that allowed working from home. The demographic data including the analysis of the characteristics of working from home, the occurrence of occupational health problems, and the lifestyle changes caused by working from home were analyzed. **Results:** A total of 869 workers were included as study participants. The highest prevalence of physical health problems among all workers was identified to be weight gain at a rate of 40.97% (95% confidence interval = 37.69-44.24), and the highest prevalence of psychosocial problems was identified to be cabin fever at a rate of 31.28% (95% confidence interval = 26.66-35.90%) among full-time working-from-home workers. The health effects that were significantly related to the intensity of working from home (p for trends <0.05), either positively or negatively, included body weight changes, ergonomic problems, indoor environmental problems, and psychosocial problems. Meanwhile, the lifestyle changes

related to work intensity included eating pattern, sleep habits, and exercise. **Conclusions:** Working from home can affect workers' well-being in various aspects. Hence, occupational health providers must prepare for risk prevention and health promotion in this "new normal" working life pattern and for future pandemics.

Ekpanyaskul et al. 2021.

Safety and Health at Work, vol. 12, no. 3.

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Keywords: Lifestyle; Psychosocial problem; Weight gain; Work-related health; Working condition.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S209379112100010X?via%3Dihub>

The perceived risk of being infected at work: An application of the job demands-resources model to workplace safety during the COVID-19 outbreak

Safety at work, both physical and psychological, plays a central role for workers and organizations during the ongoing outbreak of COVID-19. Building on the job demands-resources (JD-R) model applied to safety at work, in this study we proposed that the perceived risk of being infected with COVID-19 at work can be conceptualized as a job demand (i.e., a risk factor for work-related stress), whereas those characteristics of the job (physical and psychosocial) that help workers to reduce or manage this risk can be conceived as job resources (i.e., protective factors). We hypothesized that the perceived risk of being infected at work is positively associated with emotional exhaustion. Furthermore, we hypothesized that job resources, in terms of safety systems, communication, decision-making, situational awareness, fatigue management, and participation in decision-making, are negatively associated with emotional exhaustion. We also hypothesized that job resources buffer the association between perceived risk and emotional exhaustion. Overall, 358 workers (mean age = 36.3±12.2 years) completed a self-report questionnaire, and the hypothesized relationships were tested using moderated multiple regression. Results largely supported our predictions. The perceived risk of being infected at work was positively associated with emotional exhaustion, whereas all the job resources were negatively associated with it. Furthermore, safety systems, communication, decision-making, and participation in decision-making buffered the relationship between the perceived risk of being infected at work and emotional exhaustion. In a perspective of prevention and health promotion, this study suggested that organizations should reduce the potential risk of being infected at work, whenever possible. At same time, those characteristics of the job that can help workers to reduce or manage the risk of infection should be strengthened.

Falco et al. 2021.

PLoS One, vol. 16, no. 9.

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Keywords: COVID-19; Safety; Job demands.

Evidence Level: 6B

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0257197>

Industry and workplace characteristics associated with the downloading of a COVID-19 contact tracing app in Japan: a nation-wide cross-sectional study

Background: To combat coronavirus disease 2019 (COVID-19), many countries have used contact tracing apps, including Japan's voluntary-use contact-confirming application (COCOA). The current study aimed to identify industry and workplace characteristics associated with the downloading of this COVID-19 contact tracing app. **Methods:** This cross-sectional study of full-time workers used an online survey. Multiple logistic regression analysis was used to evaluate the associations of industry and workplace characteristics with contact tracing app use. **Results:** Of the 27,036 participants, 25.1% had downloaded the COCOA. Workers in the public service (adjusted odds ratio [aOR] = 1.29, 95% confidence interval [CI] 1.14-1.45) and information technology (aOR = 1.38, 95% CI 1.20-1.58) industries were more likely to use the app than were those in the manufacturing industry. In contrast, app usage was less common among workers in the retail and wholesale (aOR = 0.87, 95% CI 0.76-0.99) and food/beverage (aOR = 0.81, 95% CI 0.70-0.94) industries, but further adjustment for company size attenuated these associations. Workers at larger companies were

more likely to use the app. Compared with permanent employees, the odds of using the app were higher for managers and civil servants but lower for those who were self-employed. **Conclusions:** Downloading of COCOA among Japanese workers was insufficient; thus, the mitigating effect of COCOA on the COVID-19 pandemic is considered to be limited. One possible reason for the under-implementation of the contact tracing app in the retail and wholesale and food/beverage industries is small company size, as suggested by the fully adjusted model results. An awareness campaign should be conducted to promote the widespread use of the contact tracing app in these industries.

Ishimaru et al. 2021.

Environmental Health and Preventative Medicine, vol. 26, no. 1.

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Keywords: COVID-19; Contact tracing; SARS-CoV-2; Smartphone; Worksite.

Evidence Level: 4B

Link: <https://environhealthprevmed.biomedcentral.com/articles/10.1186/s12199-021-01016-1>

Work from home and musculoskeletal pain in telecommunications workers during COVID-19 pandemic: a pilot study

One of the side-effects of the COVID-19 pandemic is a global change in work ergonomic patterns as millions of people replaced their usual work environment with home to limit the spread of the severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) infection. The aim of our cross-sectional pilot study was to identify musculoskeletal pain that may have resulted from this change and included 232 telecommunications company workers of both genders [121 (52.2 %) men aged 23-62 (median 41; interquartile range 33-46 yrs.) and 111 (47.8 %) women aged 23-53 (median 40; interquartile range 33-44)] who had been working from home for eight months (from 16 March to 4 December 2020) before they joined the study. The participants were asked to fill in our web-based questionnaire by self-assessing their experience of hand, lower back, and upper back/neck pain while working at home and by describing their work setting and physical activity. Compared to previous work at the office, 90 (39.1 %) participants reported stronger pain in the lower back, 105 (45.7 %) in the upper back/neck, and 63 (27.2 %) in their hands. Only one third did not report any musculoskeletal problems related to work from home. Significantly fewer men than women reported hand, lower back, and upper back/ neck pain ($p=0.033$, $p=0.001$ and $p=0.013$, respectively). Sixty-nine workers (29.9 %) reported to work in a separate room, 75 (32.4 %) worked in a separate section of a room with other household members, whereas 87 (37.7 %) had no separate work space, 30 of whom most often worked in the dining room. Ninety-five participants (40.9 %) had no office desk to work at, and only 75 (32.3 %) used an ergonomic chair. Of those who shared their household with others ($N=164$), 116 (70.7 %) complained about constant or occasional disturbances. Over a half of all participants (52 %) said that they worked longer hours from home than at work, predominantly women ($p=0.05$). Only 69 participants (29.9 %) were taking frequent breaks, predominantly older ones ($p=0.006$). Our findings clearly point to a need to inform home workers how to make more ergonomic use of non-ergonomic equipment, use breaks, and exercise and to inform employers how to better organise working hours to meet the needs of work from home.

Radulović et al. 2021.

Archives of Industrial Hygiene and Toxicology, vol. 72, no. 3.

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Keywords: Back pain; Ergonomics; Gender; Hand pain; Neck pain; Physical activity; Work space; Work with computers.

Evidence Level: 4B

Link: <https://sciendo.com/article/10.2478/aiht-2021-72-3559>

Personal protective equipment preservation strategies in the covid-19 era: A narrative review

Background: The COVID-19 pandemic has led to personal protective equipment (PPE) supply concerns on a global scale. While efforts to increase production are underway in many jurisdictions, demand may yet outstrip supply leading to PPE shortages, particularly in low resource settings. PPE is critically important for the safety of healthcare workers (HCW) and patients and to reduce viral transmission within healthcare facilities. A structured narrative review was completed to identify methods for extending the use of

available PPE as well as decontamination and reuse. **Methods:** Database searches were conducted in MEDLINE and EMBASE for any available original research or review articles detailing guidelines for the safe extended use of PPE, and/or PPE decontamination and reuse protocols prior to September 28, 2020. Grey literature in addition to key websites from the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), Infection Prevention Association of Canada (IPAC), and the National Health Service (NHS) was also reviewed. **Results:** Extended use guidelines support co-locating patients with confirmed COVID-19 within specific areas of healthcare facilities to enable the use of PPE between multiple patients, and reduce PPE requirements outside these areas. Decontamination strategies for N95 respirators and face shields range from individual HCWs using conventional ovens and microwave steam bags at home, to large-scale centralized decontamination using autoclave machines, ultraviolet germicidal irradiation, hydrogen peroxide vapors, or peracetic acid dry fogging systems. Specific protocols for such strategies have been recommended by the US CDC and WHO and are being implemented by multiple institutions across North America. Further studies are underway testing decontamination strategies that have been reported to be effective at inactivating coronavirus and influenza, and on SARs-CoV-2 specifically. **Conclusions:** This narrative review summarizes current extended use guidelines and decontamination protocols specific to COVID-19. Preserving PPE through the implementation of such strategies could help to mitigate shortages in PPE supply, and enable healthcare facilities in low resource settings to continue to operate safely for the remainder of the COVID-19 pandemic.

Grant et al. 2021.

Infection Prevention in Practice, vol. 3, no. 3.

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Keywords: COVID-19; Decontamination; Extended use; Personal protective equipment; Reuse; SARS-CoV-2.

Evidence Level: 6A

Link: <https://www.sciencedirect.com/science/article/pii/S2590088921000354?via%3Dihub>