



Emerging Evidence Alert

January 2022

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

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Monthly research highlight

Workplace strategies to promote participation for workers experiencing mental ill-health

Supportive leadership and good relationships with colleagues are some of the most significant workplace factors that help employees experiencing mental ill-health stay at work and perform better.

A [recent study](#) of stay at work and work performance peer-reviewed articles from 1995-2020 assessed the best tools and tips employers can use to support employees. Improving the worker experience by creating a socially safe, open working climate and consulting with those who are having a hard time about how they'd best like to be supported, are among the tips recommended.

The study suggests the following factors can enable the participation of workers experiencing mental ill-health:

- Organisational climate and leadership
- Social support at work
- Job characteristics
- Coping styles
- Health symptoms and severity
- Personal characteristics

The findings highlight the importance of early intervention guiding employers to focus on workers capabilities to provide continuous social and practical support in the workplace.

For more information about creating mentally healthy workplaces, visit the Comcare website for [guidance](#). Resources available are suitable for both employers and employees and include factsheets, tips and more.



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Description of Evidence Levels Definitions Used in this Review

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

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

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

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

Fostering Work Participation

Return to Work

Managing and mitigating suffering in the return-to-work process

Background: Each year thousands of workers experience a serious illness or injury that necessitates time off work and a subsequent re-engagement with the work environment. In Australia, workers' compensation legislation mandates the return-to-work (RTW) process is formal, structured, and negotiated between the worker, their employer, health care professionals and their RTW coordinator. How this is executed by those parties directly influences whether the RTW process is supportive and successful, or exacerbates the suffering of returning workers by causing them to feel ostracised, exposed, and vulnerable in their workplace. **Methods:** In this article, we examine how the RTW process can cause physical, emotional, social, and existential suffering for returning workers. We then discuss how the suffering that workers experience can be mitigated by five key factors: clarity of roles in the RTW process, alignment of worker and employer expectations, the advocacy provided by the RTW coordinator, the support provided for the worker's psychological wellbeing, and the RTW literacy of supervisors and colleagues.

Woods et al. 2022.

Frontiers in Psychology, vol. 9.

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Keywords: Injury; Return-to-work; Suffering; Wellbeing; Workers' compensation; Workplace health and safety.

Evidence Level: 6A

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.805855/full>

Determining what constitutes an effective psychosocial 'return to work' intervention: a systematic review and narrative synthesis

Background: Work can offer a myriad of social and health benefits. Long-term sick leave can be detrimental to employers, individuals, families, and societies. The burden of long-term sick leave has motivated the development of return to work (RTW) interventions. This study sought to determine what constitutes an effective psychosocial RTW intervention, which included exploring whether the level of intervention intensity and intervention characteristics matter to RTW outcomes. **Methods:** A systematic review and narrative synthesis were undertaken. Studies were identified through six databases (Ovid Medline, CINAHL (EBSCOhost), PsycInfo (Ovid), ProQuest, Scopus, and Google Scholar) between 2011 and 3 September 2019. Randomised controlled trials (RCTs) or reviews published in English were eligible for inclusion if they targeted adults who were on sick leave/unemployed trying to return to full-capacity employment, had at least one structured psychosocial RTW intervention, and assessed RTW. Study quality was assessed using checklists from the Joanna Briggs Institute. **Results:** Database searching yielded 12,311 records. Eighteen RCTs (comprising 42 intervention/comparison groups), seven reviews (comprising 153 studies), and five grey literature documents were included. Included studies were of moderate-to-high quality. Research was primarily conducted in Europe and focused on psychological or musculoskeletal problems. RTW outcomes included RTW status, time until RTW, insurance claims, and sick days. Participating in a RTW program was superior to care-as-usual. RTW outcomes were similar between diverse interventions of low, moderate, and high intensity. Common foundational characteristics seen across effective RTW interventions included a focus on RTW, psychoeducation, and behavioural activation. **Conclusions:** Evidence suggests that a low intensity approach to RTW interventions may be an appropriate first option before investment in high intensity, and arguably more expensive interventions, as the latter appear to provide limited additional benefit. More high-quality RCTs, from diverse countries, are needed to provide stronger evidence.

Venning et al. 2022.

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

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Keywords: Intervention; Psychosocial; Return to work; Systematic review.

Evidence Level: 1A

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-11898-z>

Return to work of transgender people: A systematic review through the blender of occupational health

Background and objectives: Return to work (RTW) or work resumption after a work absence due to psychosocial or medical reasons benefits the well-being of a person, including transgender people, and is nowadays a major research domain. The objective is to examine, through an occupational lens, the literature reporting objective RTW outcomes and experiences in transgender people to (a) synthesize what is known about return to work (full-time, part-time, or self-employed) and (b) describe which gaps persist.

Methods & sample: Several databases and the gray literature were explored systematically. Studies between November 1, 2006 and March 1, 2021 revealing RTW quantitative and qualitative data of adult transgender people were eligible. This review was registered on PROSPERO (CRD42019128395) on April 30, 2019. **Results:** Among the 14,592 articles initially identified, 97 fulfilled the inclusion criteria which resulted in 20 being analyzed. Objective RTW outcomes, such as number of RTW attempts, time to RTW or number of sick days, were lacking; thus, other relevant work outcomes were reported. Compared to the general population, lower employment rates and more economic distress were observed, with trans women in particular saying that their work situation had deteriorated. Research on positive RTW experiences was highlighted by the importance of disclosure, the support from especially managers and coworkers who acted as mediators, personal coping, and a transition plan along with work accommodations. Negative work experiences, such as demotion, lay-offs, and discrimination were often prominent together with a lack of knowledge of trans issues among all stakeholders, including occupational health professionals.

Conclusion & recommendations: Few studies have explored employment characteristics and experiences of transgender people (TP). RTW is a dynamic process along with transition in itself, which should be tailored through supportive policies, education, a transition plan and work accommodations with the help of external experts. Future studies should include more occupational information and report RTW outcomes to enhance our knowledge about the guidance of TP and to make way for interventional studies.

Van de Cauter et al. 2022.

PLoS One, vol. 16, no. 11.

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Keywords: Return to work; Transgender; Occupational health.

Evidence Level: 1A

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0259206>

Vocational rehabilitation via social firms: a qualitative investigation of the views and experiences of employees with mental health problems, social firm managers and clinicians

Background: Employment within social firms in the UK is under-developed and under-researched, but a potentially beneficial route to vocational rehabilitation for people with mental health problems. This study explores the views and experiences of employees with mental ill-health, managers of social firms and mental health clinicians, in order to understand the potential value of social firms for the vocational rehabilitation, employment and well-being of people with mental health problems. **Methods:** Semi-structured interviews were conducted with 23 employees with mental health problems in 11 social firms in England. A focus group and individual interviews were conducted with 12 managers of social firms. Two focus groups were held with 16 mental health clinicians. Data were analysed using thematic analysis.

Results: Most employees expressed very positive views about working in a social firm. In responses from both employees and social firm managers, an overarching theme regarding the supportive ethos of social firms encompassed several related features: openness about mental health issues; peer, team and management support; flexibility; and support to progress and develop skills over time. Managers identified benefits of employing people with mental health problems who were sufficiently recovered. Knowledge of social firms within clinician focus groups was very limited, although clinicians thought they could be a welcome additional vocational resource. **Conclusions:** High levels of job satisfaction among social firm employees may be explained by the supportive ethos of these working environments. Social firms have potential to be a helpful addition to the range of vocational pathways available for people with mental ill-health. Further mixed methods investigations of experiences and outcomes in order to understand who engages with and benefits from this form of vocational rehabilitation would be valuable in informing decisions about scaling up the model.

Morant et al. 2022.

BMC Psychiatry, vol. 21, no. 1.

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Keywords: Mental illness; Qualitative research; Social enterprise; Social firms; Supported employment; UK; Vocational rehabilitation.

Evidence Level: 5B

Link: <https://bmcpsy psychiatry.biomedcentral.com/articles/10.1186/s12888-021-03577-5>

Predictors of return to work among women with long-term neck/shoulder and/or back pain: A 1-year prospective study

Background: Sick leave due to musculoskeletal pain, particularly in the neck/shoulders and back, is one of the major public health problems in Western countries such as Sweden. The aim of this study was to identify predictors of return to work (RTW) among women on sick leave due to long-term neck/shoulder and/or back pain. **Methods:** This was a prospective cohort study with a 1-year follow-up. The study participants were recruited from a local Swedish Social Insurance Agency register and had all been on sick leave for ≥ 1 month due to long-term (≥ 3 months) neck/shoulder and/or back pain. Data on predictors and outcome were collected using a self-administered questionnaire. A total of 208 women aged 23-64 years were included at baseline, and 141 responded at the 1-year follow-up. Cluster analyses were performed to identify one predictor from each cluster for use in the regression model. **Results:** At the 1-year follow-up, 94 of the 141 women had RTW and 47 had not. Women who engaged in more coping through increasing behavioral activities (OR: 1.14, 95% CI: 1.03-1.25) and those who more strongly believed they would return to the same work within 6 months (OR: 1.22, 95% CI: 1.10-1.37) had an increased probability of RTW. Receiving more social support outside work (OR: 0.50, 95% CI: 0.28-0.92) decreased the odds of RTW at the 1-year follow-up. **Conclusions:** Behavioral activities, beliefs about returning to the same work, and social support outside work were predictors of RTW at the 1-year follow-up. Healthcare professionals should consider these predictors in their efforts to prevent prolonged sick leave and to promote RTW in this population.

Rashid et al. 2022.

PLoS One, vol. 16, no. 11.

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Keywords: Return to work; Neck pain; Shoulder pain; Back pain.

Evidence Level: 4B

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0260490>

Evaluating the impact of intensive case management for severe vocational injuries on work incapacity and costs

Background: This study investigates the impact of an intensive case management program on sick leave days, permanent work incapacity levels and treatment costs for severe vocational injuries set up by the French National Insurance Fund in five health insurance districts. **Methods:** The method employed relies on a four-step matching procedure combining Coarsened Exact Matching and Propensity Score Matching, based on an original administrative dataset. Average Treatment effects on the Treated were estimated using a parametric model with a large set of covariates. **Results:** After one-year follow-up, workers in the treatment group had higher sickness absence rates, with 22 extra days, and the program led to 2.7 (95% CI 2.3-3.1) times more diagnoses of permanent work incapacity in the treatment group. With an estimated yearly operational cost of 2,722 € per treated worker, the average total extra treatment cost was 4,569 € for treated workers, which corresponds to a cost increase of 29.2% for the insurance fund. **Conclusions:** The higher costs found for the treatment group are mainly due to longer sick leave duration for the moderate severity group, implying higher cash transfers in the form of one-off indemnities. Even though workers in the treated group have more diagnoses of permanent work incapacity, the difference of severity between groups is small. Our results on longer sick leave duration are partly to be explained by interactions between the case managers and the occupational physicians that encouraged patients to stay longer off-work for better recovery, despite the higher costs that this represented for the insurance fund and the well-documented adverse side effects of longer periods off-work.

Leiva et al. 2022.

Journal of Occupational Rehabilitation, vol. 31, no. 4.

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Keywords: Case management; Disability leave; Matched case-control studies; Occupational injuries; Return to work.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-09967-6>

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

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

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

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

Macpherson et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 13.

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Keywords: Return to work; Disability; Vocational Rehabilitation; Construction.

Evidence Level: 4B

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

Two-year follow-up of a randomized clinical trial of inpatient multimodal occupational rehabilitation vs outpatient acceptance and commitment therapy for sick listed workers with musculoskeletal or common mental disorders

Background: There is a lack of results on long-term effects of return to work interventions. We previously reported that an inpatient multimodal occupational rehabilitation program (I-MORE) was more effective in reducing sickness absence and facilitating return to work (RTW) at 12 months follow-up compared to an outpatient program that consisted mainly of Acceptance and Commitment Therapy (O-ACT). We now report the 2-year outcome data. **Methods:** A randomized clinical trial with parallel groups. Participants were 18-60 years old, sick listed with musculoskeletal, common mental or general/unspecified disorders. I-MORE lasted 3.5 weeks and consisted of ACT, physical training and work-related problem solving. O-ACT consisted mainly of 6 weekly sessions (2.5 h. each) of ACT in groups. Outcomes were cumulated number of days on medical benefits and time until sustainable RTW (1 month without medical benefits) during 2-years of follow-up, measured by registry data. **Results:** For the 166 randomized participants, the median number of days on medical benefits was 159 (IQR 59-342) for I-MORE vs 249 days (IQR 103-379; Mann-Whitney U test, $p = 0.07$), for O-ACT. At 2 years, 40% in I-MORE received long-term benefits (work assessment allowance) vs 51% in O-ACT. The crude hazard ratio (HR) for sustainable RTW was 1.59 (95% CI 1.04-2.42, $p = 0.03$) and the adjusted HR 1.77 (95% CI 1.14-2.75, $p = 0.01$), in favor of I-MORE. **Conclusions:** The 2-year outcomes show that I-MORE had long-term positive effects on increasing work participation for individuals

sick listed with musculoskeletal and mental disorders. Further follow-up and economic evaluations should be performed.

Aasdahl et al. 2022.

Journal of Occupational Rehabilitation, vol. 31, no. 4.

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Keywords: Cognitive therapy; Mental health; Musculoskeletal diseases; Return to work; Sick leave.

Evidence Level: 2A

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-09969-4>

Return to work after lumbar disc herniation surgery: an occupational cohort study

Background and purpose: Lumbar disc herniation is a common surgically treated condition in the working-age population. We assessed health-related risk factors for return to work (RTW) after excision of lumbar disc herniation. Previous studies on the subject have had partly contradictory findings. **Patients and**

methods: RTW of 389 (n = 111 male, n = 278 female; mean age 46 years, SD 8.9) employees who underwent excision of lumbar disc herniation was assessed based on the Finnish Public Sector Study (FPS). Baseline information on occupation, preceding health, and health-risk behaviors was derived from linkage to national health registers and FPS surveys before the operation. The likelihood of RTW was analyzed using Cox proportional hazard univariable and multivariable modelling. **Results:** - 95% of the patients had returned to work at 12 months after surgery, after on average 78 days of sickness absence. Faster RTW in the univariable Cox model was associated with a small number of sick leave days (< 30 days) before operation (HR 1.3, 95% CI 1.1-1.6); high occupational position (HR 1.6, CI 1.2-2.1); and age under 40 years (HR 1.5, CI 1.1-1.9). RTW was not associated with sex or the health-related risk factors obesity, physical inactivity, smoking, heavy alcohol consumption, poor self-rated health, psychological distress, comorbid conditions, or purchases of pain or antidepressant medications in either the univariable or multivariable model. **Interpretation:** Almost all employees returned to work after excision of lumbar disc herniation. Older age, manual job, and prolonged sick leave before the excision of lumbar disc herniation were risk factors for delayed return to work after the surgery.

Laasik et al. 2022.

Acta Orthopaedica, vol. 92, no. 6.

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Keywords: Lumbar disk herniation surgery; Return to work.

Evidence Level: 4B

Link: <https://www.tandfonline.com/doi/full/10.1080/17453674.2021.1951010>

Returning to work after a sickness absence due to cancer: a cohort study of salaried workers in Catalonia (Spain)

Background: Cancer incidence and survival rates have increased in the last decades and as a result, the number of working age people diagnosed with cancer who return to work. **Methods:** In this study the probability of accumulating days of employment and employment participation trajectories (EPTs) in a sample of salaried workers in Catalonia (Spain) who had a sickness absence (SA) due to cancer were compared to salaried workers with SA due to other diagnoses or without SA. Each individual with SA due to cancer between 2012 and 2015 was matched by age, sex, and onset of time at risk to a worker with SA due to other diagnoses and another worker without SA. Accumulated days of employment were measured, and negative binomial models were applied to assess differences between comparison groups. Latent class models were applied to identify EPTs and multinomial regression models to analyse the probability of belonging to one EPT of each group. **Results:** Men and women without SA or with SA due to other diagnoses had at least a 9% higher probability of continuing in employment compared to workers who had a SA due to cancer, especially among men without SA (adjusted IRR 1.27, 95% CI 1.06–1.53). Men without SA had the highest probability of having high stable EPT compared to workers who had a SA due to cancer (adjusted RRR 3.21, 95% CI 1.87–5.50). **Conclusions:** Even though workers with SA due to cancer continue working afterwards, they do it less often than matched controls and with a less stable employment trajectory. Health and social protection systems should guaranty cancer survivors the opportunity to continue voluntary participation in the labour market.

Ayala-Garcia et al. 2022.

Scientific Reports, vol. 11, no. 1.

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Keywords: Sickness; Absence; Cancer; Return to work; Workers.

Evidence Level: 5B

Link: <https://www.nature.com/articles/s41598-021-03368-8>

Satisfying medical and rehabilitation needs positively influences returning to work after a work-related injury: an analysis of national panel data from 2018 to 2019

Background: This study examined how meeting the medical needs of injured workers after initial treatment may affect their return to work, using data from the Panel Study of Workers' Compensation Insurance.

Methods: This study was designed as a longitudinal study, which used data from the second-year, follow-up survey conducted in the secondary cohort of the Panel Study of Workers' Compensation Insurance. The odds ratio (OR) and 95% confidence interval were estimated through binomial and multinomial logistic regression analyses to examine the effects of unmet medical needs on workers' return to original work and return to work overall (including reemployment). **Results:** The returned to original work OR of workers whose rehabilitation needs were met was 1.35 (1.12-1.63) while the return to work OR was 1.20 (1.03-1.41). The returned to original work OR of workers whose medical needs were met was 1.64 (1.18-2.27) while the return to work OR was 1.39 (1.07-1.80). In terms of disability rating, the return to work ORs of workers with mild disabilities whose medical/rehabilitation needs were not met and those of workers without disabilities were 1.71 (1.17-2.49) and 1.97 (1.27-3.08), respectively. In the case of regular/temporary workers, the returned-to-work ORs of workers whose medical/rehabilitation needs were not met were 1.54 (1.12-2.13) and 1.27 (1.03-1.56), respectively. **Conclusions:** For workers who sustained work-related injuries, providing medical accessibility and meeting rehabilitation needs were found to be important predictors of return to work after initial treatment.

Bae et al. 2022.

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

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Keywords: Medical needs; Panel study of workers' compensation insurance; Rehabilitation needs; Return to work; Work-related injury.

Evidence Level: 5A

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12064-1>

Pre-return to work consultation and therapeutic part-time work: Cross-sectional study on level of knowledge and use by general practitioners in France

Background: In France, general practitioners (GPs) may use two tools specifically designed to help employees who experience difficulties in returning to work after sick leave: the pre-return-to-work (PRW) medical consultation and therapeutic part-time (TPT) work. **Objectives:** The objective was to investigate the level of knowledge and use of these two tools by GPs in Maine-et-Loire, France. **Methods:** This cross-sectional study was performed using a telephone questionnaire to evaluate the level of knowledge of GPs and the use of these two tools in patients having difficulties returning to work. **Results:** Among the 200 randomly selected GPs, 122 responded (response rate: 61%). More than half of the interviewed GPs declared they 'often' (46%) or 'always' (14%) contacted the occupational physician in these situations. Moreover, 62.2% and 32.7% believed that they had a 'vague' or 'very good' level of knowledge, and 41% and 51% declared either 'frequent' or 'regular' level of use of the PRW medical consultation, respectively. Regarding TPT work, 47% and 53% reported a 'very good' or 'vague' level of knowledge, and 41% and 51% a 'frequent' or 'regular' level of use, respectively. GPs who had a better level of knowledge of this tool reported a higher level of use ($p < 0.001$). **Conclusion:** This study shows that while the level of knowledge and use of the PRW medical consultation and TPT work is good, it is not optimal. This could be improved by organising training courses for GPs. Obstacles to their wider use could be investigated further in a qualitative study.

Bègue et al. 2022.

The European Journal of General Practice, vol. 27, no. 1.

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Keywords: General practitioners; Occupational health physicians; Return to work; Tool use behaviour.

Evidence Level: 4B

Link: <https://www.tandfonline.com/doi/full/10.1080/13814788.2021.1948007>

Barriers and facilitators for implementing motivational interviewing as a return to work intervention in a Norwegian Social Insurance Setting: A mixed methods process evaluation

Background: The aim of this study was to evaluate potential barriers and facilitators for implementing motivational interviewing (MI) as a return to work (RTW) intervention in a Norwegian social insurance setting. **Methods:** A mixed-methods process evaluation was conducted alongside a randomized controlled trial involving MI sessions delivered by social insurance caseworkers. The study was guided by the Reach, Effectiveness, Adoption, Implementation, and Maintenance framework using focus groups with the caseworkers. MI fidelity was evaluated through audio-recordings of MI sessions and questionnaires to sick-listed participants. **Results:** Lack of co-worker and managerial support, time and place for practicing to further develop MI skills, and a high workload made the MI intervention challenging for the caseworkers. The MI method was experienced as useful, but difficult to master. MI fidelity results showed technical global scores over the threshold for "beginning proficiency" whereas the relational global score was under the threshold. The sick-listed workers reported being satisfied with the MI sessions. **Conclusions:** Despite caseworker motivation for learning and using MI in early follow-up sessions, MI was hard to master and use in practice. Several barriers and facilitators were identified; these should be addressed before implementing MI in a social insurance setting.

Foldal et al. 2022.

Journal of Occupational Rehabilitation, vol. 31, no. 4.

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Keywords: Mixed-methods; Motivational interviewing; Process evaluation; RE-AIM; Return to work; Sick leave; Social insurance.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-09964-9>

'Return to Work' Coordinator Model and work participation of employees: A natural intervention study in Finland

Background: Employers increasingly use 'return to work' (RTW) coordinators to support work ability and extend working careers, particularly among employees with reduced work ability. We examined whether applying this model was associated with changes in employee sickness absence and disability retirements. **Methods:** We used data from the Finnish Public Sector study from 2009 until 2015. Employees where the model was introduced in 2012 constituted the cases ($n = 4120$, one municipality) and employees where the model was not in use during the follow-up, represented the controls ($n = 5600$, two municipalities). We analysed risk of disability retirement in 2013-2015 and risk of sickness absence after (2013-2015) vs. before (2009-2011) intervention by case-control status. **Results:** The incidence of disability retirement after the intervention was lower in cases compared to controls both in the total population (hazard ratio $HR = 0.49$, 95% CI 0.30-0.79) and in the subgroup of participants with reduced work ability ($HR = 0.34$, 95% CI 0.12-0.99). The risk of sickness absence increased from pre-intervention to post-intervention period both among cases and controls although the relative increase was greater among cases ($RR_{\text{post- vs. pre-intervention}} = 1.26$, 95% CI 1.14-1.40) than controls ($RR_{\text{post- vs. pre-intervention}} = 1.03$, 95% CI 0.97-1.08). In the group of employees with reduced work ability, no difference in sickness absence trends between cases and controls was observed. **Conclusions:** These findings suggest that RTW-coordinator model may increase employee sickness absence, but decrease the risk of disability retirement, i.e., permanent exclusion from the labour market.

Kausto et al. 2022.

Journal of Occupational Rehabilitation, vol. 31, no. 4.

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Keywords: Disability management; Municipalities; Return to work coordination; Sickness absence; Work ability.

Evidence Level: 3B

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-09970-x>

Presenteeism and Absenteeism

Impacts of heavy smoking and alcohol consumption on workplace presenteeism: A cross-sectional study

Background: Presenteeism refers to the practice of going to work despite poor health, resulting in subpar performance. This study aimed to explore the impacts of smoking and alcohol consumption on workplace presenteeism based on demographic, health-related, and employment variables. **Methods:** The study adopted a cross sectional design with 60,051 wage workers from the database of the second and third Korean Working Conditions Surveys in 2010 and 2011, respectively. A total of 41,404 workers aged 19 years and older, who had worked for at least 1 hour in the previous week, answered the survey questions. Chi-square test as well as univariate and multiple logistic regression analyses were conducted using SPSS, version 18.0, to determine the impacts of smoking and alcohol consumption on workplace presenteeism.

Results: Of the 41,404 Korean workers, 8512 (20.6%) had experienced presenteeism in the past 12 months. There were significant differences among gender, age, educational status, income, health problems, absenteeism, shift work, night shift, weekly working hours, exposure to secondhand smoke at work, and satisfaction with the workplace environment. Based on the results of multiple regression analysis, heavy smoking (adjusted odds ratio = 1.38, 95% confidence intervals [1.11, 1.72]) and high-risk drinking (adjusted odds ratio = 1.19, 95% confidence intervals [1.08, 1.31]) were significantly related to presenteeism among workers. The results of our study confirmed that smoking and alcohol drinking were related to presenteeism even after controlling other variables (demographic, health-related, and employment variables) that affect presenteeism. Smoking and alcohol drinking are associated with and potentially influence presenteeism; in particular, heavy smoking and high-risk drinking contributed to presenteeism.

Conclusion: Companies that encourage employees to receive treatments for reduction of smoking or alcohol consumption may benefit from greater productivity. Hence, we should consider the impact of smoking and alcohol consumption in the workplace and build appropriate strategies and programs to help reduce these behaviors.

Lee et al. 2022.

Medicine (Baltimore), vol. 24, no. 100.

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Keywords: Heavy smoking; Alcohol; Workplace presenteeism.

Evidence Level: 4B

Link: [https://journals.lww.com/md-](https://journals.lww.com/md-journal/Fulltext/2021/11240/Impacts_of_heavy_smoking_and_alcohol_consumption.6.aspx)

[journal/Fulltext/2021/11240/Impacts_of_heavy_smoking_and_alcohol_consumption.6.aspx](https://journals.lww.com/md-journal/Fulltext/2021/11240/Impacts_of_heavy_smoking_and_alcohol_consumption.6.aspx)

Causes of sickness absenteeism in Europe-Analysis from an intercountry and gender perspective

Background: This study aims to extract and explain the territorially varied relation between socioeconomic factors and absence rate from work due to own illness or disability in European countries in the years 2006-2020. For this purpose, several causes were identified, depending on men and women. **Methods:** To explain the absenteeism and emphasize gender as well as intercountry differences, geographically weighted regression was applied. **Results:** For men, there were five main variables that influenced sickness absence: body mass index, the average rating of satisfaction by job situation, employment in the manufacturing sector, social benefits by sickness/health care, and performing health-enhancing physical activity. For women, there were five main variables that increased the absence rate: the risk of poverty or social exclusion, long-standing illness or health problems, employment in the manufacturing sector, social protection benefits, and deaths due to pneumonia. Based on the conducted research, it was proven that the sickness absence observed in the analyzed countries was highly gender and spatially diverged.

Conclusions: Understanding the multifactorial factors playing an important role in the occurrence of regional and gender-divergent sickness absence may be a good predictor of subsequent morbidity and mortality as well as be very useful to better prevent this outcome.

Antczak et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 22.

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Keywords: Europe; Gender inequalities; Geographically weighted regression; Regionality; Sickness absenteeism; Socioeconomic factors.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/22/11823>

Sickness absence and disability pension among injured working-aged pedestrians - a population-based Swedish register study

Background: The knowledge is scarce about sickness absence (SA) and disability pension (DP) among pedestrians injured in a traffic-related accident, including falls. Thus, the aim was to explore the frequencies of types of accidents and injuries and their association with SA and DP among working-aged individuals. **Methods:** A nationwide register-based study, including all individuals aged 16-64 and living in Sweden, who in 2010 had in- or specialized outpatient healthcare after a new traffic-related accident as a pedestrian. Information on age, sex, sociodemographics, SA, DP, type of accident, injury type, and injured body region was used. Frequencies of pedestrians with no SA or DP, with ongoing SA or full-time DP already at the time of the accident, and with a new SA spell >14 days in connection to the accident were analyzed. Crude and adjusted odds ratios (ORs) with 95% confidence intervals (CIs) for new SA were estimated by logistic regression. **Results:** In total, 5576 pedestrians received healthcare due to a traffic-related accident (of which 75% were falls, with half of the falls related to snow and ice). At the time of the accident, 7.5% were already on SA and 10.8% on full-time DP, while 20% started a new SA spell. The most common types of injuries were fractures (45%) and external injuries (30%). The body region most frequently injured was the lower leg, ankle, foot, and other (in total 26%). Older individuals had a higher OR for new SA compared with younger (OR 1.91; 95% CI 1.44-2.53, for ages: 45-54 vs. 25-34). The injury type with the highest OR for new SA, compared with the reference group external injuries, was fractures (9.58; 7.39-12.43). The injured body region with the highest OR for new SA, compared with the reference group head, face, and neck, was lower leg, ankle, foot, and other (4.52; 2.78-7.36). **Conclusions:** In this explorative nationwide study of the working-aged pedestrians injured in traffic-related accidents including falls, one fifth started a new SA spell >14 days. Fractures, internal injuries, collisions with motor vehicle, and falls related to snow and ice had the strongest associations with new SA.

Kjeldgård et al. 2022.

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

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Keywords: Cross-sectional; Disability pension; Fall accidents; Insurance medicine; Pedestrians; Population-based; Real-world data; Sick leave; Traffic injury.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12312-4>

The effect of mental and physical health problems on sickness absence

Background: Absenteeism is an important feature of the labour market, imposing significant costs on employers and the economy as a whole. **Methods:** This paper is the first to use a large labour force survey sample to investigate how different physical and mental health conditions affect absence rates among prime age workers in the UK. **Results:** A pooled time series/cross-section analysis reveals that people with a chronic health condition are more likely to be absent from work, and mental health has a significantly larger effect than physical health. From a longitudinal perspective, we find that a change in mental health has an effect on absenteeism more than three times greater than a change in physical health. **Conclusion:** These findings imply that the prevention and alleviation of chronic health conditions, particularly common mental disorders such as depression and anxiety that are highly prevalent in prime age workers, will deliver significant benefits to the UK economy due to reduced absenteeism. Further, there is significant heterogeneity between different health conditions, with some having no effect at all on absenteeism having controlled for other factors.

Bryan et al. 2022.

The European Journal of Health Economics, vol. 22, no. 9.

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Keywords: Absenteeism; Labour force survey; Labour market; Mental health; Physical health.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs10198-021-01379-w>

Associations of employment sector and occupational exposures with full and part-time sickness absence: random and fixed effects analyses on panel data

Background: We aimed to investigate the influence of unobserved individual characteristics in explaining the effects of work-related factors on full (fSA) and part-time sickness absence (pSA). **Methods:** We used register-based panel data for the period 2005-2016 on a 70% random sample of the Finnish working-age population. The relationships between employment sector and occupational exposures (% exposed to physically heavy work and job control score based on job exposure matrices) and the annual onset of fSA and pSA were investigated among men and women. First, random effects (RE) models were applied controlling for observed sociodemographic factors and then fixed effects (FE) models that examine within-individual changes over time and thereby further account for unobserved time-invariant individual characteristics. **Results:** In the RE analyses, public employment sector, physically heavy work and lower job control each increased the use of fSA and pSA among both genders. When unobserved individual characteristics were controlled for with the FE models, the effects on fSA attenuated. For pSA, the effects of employment sector and physical heaviness of work among women even reversed. The effect of lower job control on pSA remained especially among women. **Conclusions:** The role of individuals' unobserved characteristics in explaining the effects of work-related factors on SA should not be neglected. The effects of work-related factors are likely to be overestimated when using traditional approaches that do not account for unobserved confounding, ie, selection of individuals with a high likelihood of SA into particular work environments.

Hartikainen et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 1.

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Keywords: Sickness absence; Occupational exposures; Employment.

Evidence Level: 4B

Link: <https://www.sjweh.fi/article/4003>

Working Hours

How does working nonstandard hours impact psychological resources important for parental functioning? Evidence from an Australian longitudinal cohort study

Background: This study investigates the link between nonstandard schedules and three psychological resources salient to working parents' parental functioning (psychological distress, work-family conflict and relationship quality). **Methods:** Data from fathers and mothers are analysed separately, using a nationally representative sample of dual-earner parents (6190 observations from 1915 couples) drawn from the Longitudinal Study of Australian Children (LSAC). The LSAC data was collected between 2008 and 2018 (with data collected every two years). Hybrid analysis models were conducted to identify within-person changes in these psychological resources in association with moving in and out of nonstandard work schedules, as well as between-person differences between parents working standard hours and nonstandard hours. **Results:** The results indicate that the connections between working nonstandard schedules and the psychological resources were patterned differently across genders. No significant differences in psychological distress were found between those working nonstandard schedules and those working standard schedules for either fathers or mothers. Fathers working nonstandard schedules had higher work-family conflict compared to fathers working standard schedules, while no such effect found for mothers. This effect for fathers was largely explained by other characteristics related to working a nonstandard schedule, rather than the schedule itself. For fathers (but not mothers), working nonstandard schedules was significantly, and potentially causally, associated with lower relationship quality (i.e. within-person effects were found). Additional supplementary analyses found the connections between work schedules and psychological resources varied somewhat across different types of schedules (i.e.

evening/night shift, rotating shift and irregular shift). **Conclusion:** As one of the first nationally representative longitudinal studies to explore changes in work schedules in association with changes in parents' psychosocial resources, the impacts for fathers (particularly relationship quality) are an important line for future enquiry.

Zhao et al. 2022.

SSM Population Health, vol. 24.

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Keywords: Longitudinal; Nonstandard schedules; Parents; Psychological distress; Relationship quality; Shift work; Wellbeing; Work-family conflict.

Evidence Level: 4A

Link: <https://www.sciencedirect.com/science/article/pii/S2352827321002068?via%3Dihub>

Worker perspectives on the impact of non-standard workdays on worker and family well-being: A qualitative study

Background: Non-standard work schedules (NSWSs), occurring outside of regular and predictable daytime hours, may negatively affect worker and family health. This qualitative study sought to understand worker perspectives on the health and well-being impacts of NSWSs among full-time, transportation maintainers, correctional, and manufacturing workers. **Methods:** Forty-nine workers participated in 8 focus groups. Data were transcribed and analyzed with ATLAS.ti, using the constant comparative method to identify themes and sub-themes. **Results:** Workers reported that long work hours and irregular and unpredictable schedules posed the biggest obstacles to their well-being. Workers reported that NSWSs were associated with behavior impacts (poor family and social connections, poor eating, poor sleep, lack of exercise recovery), physical health impacts (exhaustion, weight gain) and extended work exposures (increased stress, increased accidents). **Conclusions:** This highlights the importance of developing and implementing effective workplace interventions to address these barriers to health and health behaviors.

Suleiman et al. 2022.

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

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Keywords: Long hours; Shift work; Work schedule; Worker well-being.

Evidence Level: 5B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12265-8>

The association between long working hours and infertility

Background: This study aimed to investigate whether working long hours was related to infertility among female Korean workers, while taking age into consideration. **Methods:** We used data from the 2018 National Survey on Fertility and Family Health and Welfare in Korea that is a cross-sectional, nationally representative, and population-based survey. Infertility was defined as women who were not pregnant after regular unprotected intercourse for a year. Working long hours was classified as ≥ 52 hours, and subgroups as per age were classified on the basis of being younger or older than 40 years of age. Differences in infertility risk between the long working hour group and none were estimated in crude and fully adjusted logistic regression models with age-group stratification. **Results:** Of 5,909 Korean female workers, the crude and adjusted odds ratios (95% confidence intervals) of infertility for working long hours were 1.295 (0.948-1.737) and 1.303 (0.921-1.809), respectively. In the subgroup of patients below 40 years of age, the crude and adjusted odds ratios (95% confidence interval) were 1.957 (1.216-3.039) and 1.921 (1.144-3.120), whereas those aged 40 years or older had 0.994 (0.647-1.471) and 0.939 (0.560-1.501), respectively. The weighted prevalence of infertility increased as weekly working hours increased only for the younger than 40-year subgroup. **Conclusions:** Infertility is associated with working long hours, especially in young-aged workers. Thus, the working schedule must be structured to better suit young female workers.

Ahn et al. 2022.

Safety and Health at Work, vol. 12, no. 4.

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Keywords: Infertility; Republic of Korea; Women; Women, working.

Evidence Level: 4B

Link: [https://linkinghub.elsevier.com/retrieve/pii/S2093-7911\(21\)00058-5](https://linkinghub.elsevier.com/retrieve/pii/S2093-7911(21)00058-5)

Long working hours and risk of 50 health conditions and mortality outcomes: a multicohort study in four European countries

Background: Studies on the association between long working hours and health have captured only a narrow range of outcomes (mainly cardiometabolic diseases and depression) and no outcome-wide studies on this topic are available. To achieve wider scope of potential harm, we examined long working hours as a risk factor for a wide range of disease and mortality endpoints. **Methods:** The data of this multicohort study were from two population cohorts from Finland (primary analysis, n=59 599) and nine cohorts (replication analysis, n=44 262) from Sweden, Denmark, and the UK, all part of the Individual-participant Meta-analysis in Working Populations (IPD-Work) consortium. Baseline-assessed long working hours (≥ 55 hours per week) were compared to standard working hours (35-40 h). Outcome measures with follow-up until age 65 years were 46 diseases that required hospital treatment or continuous pharmacotherapy, all-cause, and three cause-specific mortality endpoints, ascertained via linkage to national health and mortality registers.

Findings: 2747 (4.6%) participants in the primary cohorts and 3027 (6.8%) in the replication cohorts worked long hours. After adjustment for age, sex, and socioeconomic status, working long hours was associated with increased risk of cardiovascular death (hazard ratio 1.68; 95% confidence interval 1.08-2.61 in primary analysis and 1.52; 0.90-2.58 in replication analysis), infections (1.37; 1.13-1.67 and 1.45; 1.13-1.87), diabetes (1.18; 1.01-1.38 and 1.41; 0.98-2.02), injuries (1.22; 1.00-1.50 and 1.18; 0.98-1.18) and musculoskeletal disorders (1.15; 1.06-1.26 and 1.13; 1.00-1.27). Working long hours was not associated with all-cause mortality. **Interpretation:** Follow-up of 50 health outcomes in four European countries suggests that working long hours is associated with an elevated risk of early cardiovascular death and hospital-treated infections before age 65. Associations, albeit weak, were also observed with diabetes, musculoskeletal disorders and injuries. In these data working long hours was not related to elevated overall mortality. **Funding:** NordForsk, the Medical Research Council, the National Institute on Aging, the Wellcome Trust, Academy of Finland, and Finnish Work Environment Fund.

Ervasti et al. 2022.

The Lancet Regional Health - Europe, vol. 6.

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Keywords: Long working hours; Health conditions; Mortality; Europe.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S2666776221001897?via%3Dihub>

The nonlinear consequences of working hours for job satisfaction: The moderating role of job autonomy

Background: Overwork is a common phenomenon worldwide. Although previous studies have found that long working hours can cause physical and mental health problems in employees, the nature of the relationship between working hours and job satisfaction remains little understood. We have theorised that there is a curvilinear association between working hours and job satisfaction, and tested this hypothesis.

Methods: A total of 771 adult Chinese employees submitted self-reported measures of working hours, job satisfaction, and job autonomy. **Results:** The results show that working hours have an inverted U-shaped association with job satisfaction. **Conclusion:** Work scheduling autonomy and decision-making autonomy moderate this relationship. Here we present our data and discuss their theoretical and practical implications.

Dong et al. 2022.

Current Psychology, vol. 12, no. 1-22.

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Keywords: Job autonomy; Job demands-resources model; Job satisfaction; Working hours.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8589456/>

Building Employer Capability

Wellness Programs

Influence of nutrition, food and diet-related interventions in the workplace: A meta-analysis with meta-regression

Background: To review the scientific literature on the influence of verified nutrition, food and diet interventions on occupational health. **Method:** This study involved a critical analysis of articles retrieved from MEDLINE (via PubMed), Embase, Cochrane Library, PsycINFO, Scopus, Web of Science, Latin American and Caribbean Health Sciences Literature (LILACS) and Medicina en Español (MEDES) using the descriptors "Diet, Food, and Nutrition" and "Occupational Health" and applying the filters "Clinical Trial", "Humans" and "Adult: 19+ years"; the search was conducted on 29 May 2021. **Results:** A total of 401 references were retrieved from the bibliographic databases, with an additional 16 identified through a secondary search; among the studies retrieved, 34 clinical trials were selected after applying the inclusion and exclusion criteria. The interventions were grouped into seven categories: (1) dietary interventions associated with exercise or educational programs; (2) individual environmental interventions or other educational actions; (3) educational interventions oriented toward lifestyle, dietetics, physical activity and stress management; (4) economic incentives; (5) multicomponent interventions (combination of mindfulness, e-coaching and the addition of fruits and vegetables); or dietary interventions (facilitating greater food supply in cafeterias); or interventions focused on physical exercise. **Conclusions:** Given that most people spend a large part of their time in the workplace and, therefore, eat at least one of their daily meals there, well-planned interventions-preferably including several strategies-have been demonstrated, in general, as useful for combating overweight and obesity. From the meta-regression study, it was observed that the interventions give better results in people who presented high Body Mass Index (BMI) values (obesity). In contrast, intervention 2 (interventions related to workplace environment) would not give the expected results (it would increase the BMI).

Melián-Fleitas et al. 2022.

Nutrients, vol. 13, no. 11.

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

Keywords: Diet; Food; Nutrition; Obesity; Occupational health; Occupational health policy; Overweight; Working conditions; Workplace.

Evidence Level: 1A

Link: <https://www.mdpi.com/2072-6643/13/11/3945>

The effectiveness of nutrition and health intervention in workplace setting: A systematic review

Background: The health status of workers is crucial to maintain their productivity and it will impact on output per capita. This systematic review aims to evaluate the effectiveness of nutrition and health interventions in the workplace setting and the implications for further research. **Methods:** Articles were searched from PubMed, PMC, Cochrane Library (Trial), Science-direct, and Google scholar databases, published from 2005-2020. Inclusion criteria were a nutrition and health intervention, involving subjects aged 19-64 years old using an experimental randomized control trial (RCT) or non-RCT study design. Keywords used for literature searching included "nutrition education in workplace", "nutrition intervention in workplace", and "workplace intervention". Data were narratively described. **Results:** Eleven studies met the inclusion criteria and were further reviewed. Five studies focused on intervening in the food environment in the workplace, four studies focused on nutrition education, using different channels i.e., workplace visiting and emails, the other two interventions focused on reducing health risk regarding occupational health. Positive outcomes were recorded for all workplace interventions, including an increase in nutrition knowledge, self-efficacy, reduced risky behavior, and also improved body mass index and blood biomarkers. **Conclusion:** Workplace nutrition and health interventions proved to be an effective way to enhanced balanced nutrition behavior and improve health status. This study implies an urgency of nutrition and health intervention in a workplace.

Rachmah et al. 2022.

Journal of Public Health Research, vol 15.

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Keywords: Nutrition; Health intervention; Workplace.

Evidence Level: 1A

Link: <https://www.jphres.org/index.php/jphres/article/view/2312>

Organisational Issues

Gaining a better understanding of the types of organizational culture to manage suffering at work

Background: Organizational culture is a central concept in research due to its importance in organizational functioning and suffering of employees. To better manage suffering, it is necessary to better understand the intrinsic characteristics of each type of culture and also its relationships with the environment.

Methods: In this study, we used the multiple regression analysis to analyze the capacity of eight environment variables, five business strategies, and eight organizational competencies to predict the presence of Clan, Market, and Hierarchy cultures (Cameron and Quinn, 1999) in a subsample of Spanish managers (n 1 = 362) and a subsample of Peruvian managers (n 2 = 1,317). **Results:** Contrary to what most of the literature suggests, we found almost no relationship between the environmental variables and the culture types. Strategy and competencies, in contrast, do have a significant predictive capacity, showing 9 links with the Clan culture, 7 with the Hierarchy culture, and 10 with the Market culture. **Conclusion:** In conclusion, this study has found the important characteristics of the types of organizational culture that could be useful to better manage the suffering of employees.

Assens-Serra et al. 2022.

Frontiers in Psychology, vol. 22, no. 12.

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Keywords: Clan culture; Extrinsic variables; Hierarchy culture; Intrinsic variables; Job (un)satisfaction; Market culture; Organizational culture; Suffering at work.

Evidence Level: 5B

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.782488/full>

The mechanism of goal-setting participation's impact on employees' proactive behavior, moderated mediation role of power distance

Background: Organizations nowadays are under immense external pressure due to advancements in information technology, making it precarious. It also inserts extra pressure to keep the employees motivated and productive. Therefore, while information technology benefits the organization, it also challenges the organization and employees more. In order to meet these challenges, many organizations have begun to flatten their organizational structures and decentralized their management approaches.

Methods: This study collected 336 valid questionnaires from 20 service companies. The reliability and validity of the questionnaire were tested. In addition, the exploratory factor analysis and confirmatory factor analysis. Relevant analysis and empirical analysis were also carried out using hierarchical regression.

Results: The study finds that (1) Goal-setting participation positively affects employees' proactive behavior. (2) Perceived insider status plays a mediating role between goal-setting participation and employee proactive behavior. (3) The power distance positively modifies the goal-setting participation in the relationship of employee's perceived insider status. (4) Power distance positively moderates perceived insider status in the relationship of goal-setting participation on employee proactive behavior through perceived insider status. This research applies goal-setting theory and social cognition theory to build a theoretical framework for the influence mechanism of goal-setting participation on employee's proactive behavior. Expands the application scope of fundamental theoretical research and improve understanding of the relationship between goal-setting participation and employee's proactive behavior. **Conclusion:** The research conclusions help organizations understand the formation mechanism of employees' proactive behaviors, strengthen the focus on goal-setting participation, and optimize the relationship between leaders and employees.

Pervaiz et al. 2022.

PLoS One, vol. 16, no. 12.

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Keywords: Employees; Proactivity; Motivation; Goal-setting.

Evidence Level: 5B

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0260625>

Impact of different work organizational models on gender differences in exposure to psychosocial and ergonomic hazards at work and in mental and physical health

Background: To examine differences between genders in exposure to psychosocial and ergonomic factors at work and in work-related health, according to different work organization models. **Methods:** The study population included a sample of 9749 (women: 37.1%) and 10,374 (women: 39.9%) employees who participated in the 2010 and 2015 European Working Conditions Surveys, respectively. Multiple Correspondence Analysis was applied to work characteristics reported by workers to estimate principal components, followed by Hierarchical Clustering on principal components to identify clusters of work organization models. Gender differences in exposure to work hazards and health outcomes were assessed through Poisson robust regression. Differences of PRs across organizational models were tested through interaction between gender and type of work organization. **Results:** Three organizational models were identified in 2010, including lean production, Tayloristic production, and a "reflexive production" model, whereas in 2015, a "simple" or traditional model was also found. In 2010, women employed in companies adopting the Tayloristic or the lean production models were more likely than men to be exposed to unfavourable psychosocial and physical work factors, and to report musculoskeletal pain, compared to those belonging to reflexive production. In 2015, a significantly higher female/male ratio persisted in lean production for exposure to high job strain and for carrying/moving heavy loads, whereas gender differences in Tayloristic and traditional production were quite similar to those of reflexive production. **Conclusions:** Our results suggest that employment in workplaces characterized by lower monotony, repetitiveness, and production constraints may contribute to reduce exposure to job strain among working women.

Migliore et al. 2022.

International Archives of Occupational and Environmental Health, vol. 94, no. 8.

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Keywords: Epidemiology; Gender; Health; Work hazards; Work organization.

Evidence Level: 4A

Link: <https://link.springer.com/article/10.1007%2Fs00420-021-01720-z>

Job Design

Working at home and expectations of being available: effects on perceived work environment, turnover intentions, and health

Background: The aim of this study was to determine if (i) working at home and (ii) expectations of being available to the employer in their spare time influences employees' perceptions of their work environment and well-being, health, organizational commitment, or intention to leave. **Methods:** We conducted cross-sectional analyses of survey data from 7861 office workers reporting hours worked at home and 3146 reporting frequency of expectations of being available to the employer in spare time (availability expectations). Prospective analyses (two-year follow up) comprised 5258 and 2082, respectively. Dependent variables were work factors previously associated with health complaints, mental distress, positive affect, work-private life conflict, commitment, and intention to leave. Random intercept linear and logistic regressions controlled for time worked (in addition to regular hours), age, gender, and skill level. **Results:** "Hours working at home" was cross-sectionally associated with higher levels of demands, role ambiguity, role conflicts, decision control, empowering leadership, human resource primacy, commitment, work-private life conflict, and lower support from co-workers. "Availability expectations" was associated with higher levels of demands, role conflicts, neck pain, mental distress, thinking that work was not finished when going to bed, sleep problems, work-private life conflict, intentions to leave and with lower levels of

superior support, co-worker support, fair leadership, and commitment. There were no prospective associations. **Conclusions:** Working at home was associated with both positive and negative factors. Specific factors pertaining to role expectations and support from co-workers pose challenges. Availability expectations was associated with potentially negative work factors and health, organizational commitment, and intentions to leave. There were no long-term effects.

Knardahl et al. 2022.

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

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

Keywords: Expectations; Work from home; Availability; Work environment; Health.

Evidence Level: 4A

Link: <https://www.sjweh.fi/article/3996>

Impact of role conflict on intention to leave job with the moderating role of job embeddedness in banking sector employees

Background: This study investigates why some employees intend to leave their jobs when facing conflict between family responsibilities and job routines. The present study also reveals the moderating role of on-the-job embeddedness between role conflict and intention to leave the job. Drawing on conservation of resources theory, the paper investigates the buffering effect of the three on-the-job embeddedness components (fit, links, and sacrifice). **Methods:** Data were collected from banking officers because most of the employees have to face role conflict between family and job responsibilities, as banking is considered among the most stressful jobs. Collected data were analyzed by applying structural equation modeling.

Results: Results indicate that the role conflict significantly influences intention to leave the job. Furthermore, the study shows that on-the-job embeddedness moderates the relationship between role conflict and intention to leave. The results suggest that organizations can reduce turnover intention during times of work and life conflict by developing employee on-the-job embeddedness. **Conclusion:** This study provides some insights to managers on why many employees leave their jobs and how to overcome this problem. Management should also offer extra and available resources in periods of greater tension to minimize early thinking regarding quitting.

Awan et al. 2022.

Frontiers in Psychology, vol. 19, no. 12.

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Keywords: Pakistan; Bank employees; Intention to leave; Job embeddedness; Role conflict.

Evidence Level: 5B

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.719449/full>

How does office design support employees' health? A case study on the relationships among employees' perceptions of the office environment, their sense of coherence and office design

Background: This study investigated the current design circumstances of an office as well as employees' perceptions of the office environment in relation to their perceived health, drawing on sense of coherence theory (comprehensibility, manageability, and meaningfulness). Previous studies have related the physical office environment to employee health. However, most studies have focused on alleviating negative effects, while health-promoting potential, including employee sense of coherence, has been overlooked.

Methods: This study adopted a mixed method case study approach, combining semi-structured interviews with employees, structured observations, and analysis of architectural drawings. **Results:** The results indicated that employees' perceptions did not always align with the ideas behind the architectural design and that employees understood the environment differently. The study also highlighted the interrelations (and contradictions) among the different components of sense of coherence. The findings imply that organizations may need to prioritize which components of coherence should be supported most by the office environment. It also suggests that case-specific design aspects should play a more central role in studying and conceptualizing healthy office design and that design solutions should be continuously modified during the use phase, while ensuring employees' participation. **Conclusion:** The study concluded that an 'ideal' office environment should not be the goal. Instead, office design should provide an

environment in which employees are able to cope with challenges in comprehensible, manageable and meaningful ways.

Forooraghi et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: Case study; Flexible office; Health; Office design; Salutogenic; Sense of coherence; Well-being; Workplace design.

Evidence Level: 5A

Link: <https://www.mdpi.com/1660-4601/18/23/12779>

Shift Work

The association between shift work and possible obstructive sleep apnea: A systematic review and meta-analysis

Background: Shift work is a work schedule, since industrial era and some employees work in shift. It causes a desynchronization of the biological clock with consequences on sleep amount and quality, such as insomnia and easy fatigue. Obstructive sleep apnea (OSA) is one of the sleep problems that are getting more and more attention, but studies on the association between shift work and OSA were rare. Herein, we aimed to conduct a systematic review and meta-analysis to investigate the association between shift work and possible OSA. **Methods:** This study was conducted according to Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. We queried PubMed, Embase, and Web of Science databases using a related set of keywords. The inclusion criteria were as follows: (1) participants were adult employees hired by a company or organization; (2) exposure was shift work; and (3) outcome was possible OSA according to examination or assessment. **Results:** We included six studies in the systematic review and five studies were selected for further meta-analysis. A random-effects model showed an association of shift work with a small, non-significant increase in possible OSA cases (pooled prevalence relative risk = 1.05; 95% CI 0.85-1.30; $p = 0.65$). This association occurred in both healthcare and non-healthcare workers group. **Conclusion:** The association between shift work and possible OSA remains inconclusive and could be small if not negligible. Future studies should assess the association between specific work schedules and specific OSA definitions.

Yang et al. 2022.

International Archives of Occupational and Environmental Health, vol. 94, no. 8.

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Keywords: Meta-analysis; Obstructive sleep apnea; Shift work.

Evidence Level: 1A

Link: <https://link.springer.com/article/10.1007%2Fs00420-021-01675-1>

The association between the number of consecutive night shifts and insomnia among shift workers: A multi-center study

Background: There is a need to determine the optimal limit of consecutive night shift work to reduce insomnia caused by the accumulation of sleep problems among night shift workers. This study aimed to investigate the prevalence of insomnia caused by consecutive night shifts and evaluate the night shift duration that worsens insomnia the most, using a large amount of medical examination data. **Methods:** Night shift profiles and baseline demographics data of three hospitals were collected from January 2015 to December 2017. For subjects who had been examined more than once at the same institution, information corresponding to the most recent date was used. Multivariate logistic regression was performed to estimate odds ratios (ORs) and 95% confidence intervals (CIs). Pooled ORs were calculated by using the results of the three institutions. **Results:** Of the 33,669 participants, 31.3% were female. The average age was 41.1 ± 11.1 years and the prevalence of insomnia was 38.7% ($n = 13,025$). After adjusting for potential confounders and compared to workers who reported not working in consecutive night shifts, odds of insomnia were greatest among workers reporting working three consecutive nights (OR 2.65, 95% CI 1.97-3.56) followed by those working two nights (OR 1.81, 95% CI 1.45-

2.26), five nights (OR 1.78, 95% CI 1.56-2.03), and four nights (OR 1.68, 95% CI 1.55-1.82). **Conclusion:** Our study demonstrates a significant relationship between consecutive night shift and insomnia with multicenter examination data, using common data model. This study could be a basis for establishing policies and guidelines that improve night shift workers' health.

Sim et al. 2022.

Frontiers in Public Health, vol. 17.

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Keywords: Common data model (CDM); Consecutive night shifts; Insomnia; Medical examination data; Shift workers.

Evidence Level: 4A

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2021.761279/full>

Long-term nightshift work and breast cancer risk: An updated systematic review and meta-analysis with special attention to menopausal status and to recent nightshift work

Background: This systematic review discusses long-term NSW and female BC risk, with special attention to differences between pre- and postmenopausal BC, to test the association with recent NSW. **Methods:** The review follows PRISMA guidelines (Prospero registry: CRD42018102515). We searched PubMed, Embase, and WOS for case-control, nested case-control, and cohort studies addressing long-term NSW (≥ 15 years) as risk exposure and female BC as outcome until 31 December 2020. Risk of bias was evaluated with the Newcastle-Ottawa scale. **Results:** Eighteen studies were finally included (eight cohorts; five nested case-control; five case-control). We performed meta-analyses on long-term NSW and BC risk; overall and by menopausal status; a subanalysis on recent long-term NSW, based on studies involving predominantly women below retirement age; and a dose-response meta-analysis on NSW duration. The pooled estimate for long-term NSW and BC was 1.13 (95%CI = 1.01-1.27; 18 studies, $I^2 = 56.8\%$, $p = 0.002$). BC risk increased 4.7% per 10 years of NSW (95%CI = 0.94-1.09; 16 studies, $I^2 = 33.4\%$, $p = 0.008$). The pooled estimate for premenopausal BC was 1.27 (95%CI = 0.96-1.68; six studies, $I^2 = 32.0\%$, $p = 0.196$) and for postmenopausal BC 1.05 (95%CI = 0.90-1.24, $I^2 = 52.4\%$; seven studies, $p = 0.050$). For recent long-term exposure, the pooled estimate was 1.23 (95%CI = 1.06-1.42; 15 studies; $I^2 = 48.4\%$, $p = 0.018$). **Conclusion:** Our results indicate that long-term NSW increases the risk for BC and that menopausal status and time since exposure might be relevant.

Schwarz et al. 2022.

Cancers (Basel), vol.13, no. 23.

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Keywords: Breast cancer; Menopausal status; Meta-analysis; Nightshift work; Occupational exposure; Recent exposure; Retirement age.

Evidence Level: 1A

Link: <https://www.mdpi.com/2072-6694/13/23/5952>

Length of exposure to long working hours and night work and risk of sickness absence: a register-based cohort study

Background: There is inconsistent evidence that long working hours and night work are risk factors for sickness absence, but few studies have considered variation in the length of exposure time window as a potential source of mixed findings. We examined whether the association of long working hours and night work with sickness absence is dependent on the length of exposure to the working hour characteristics.

Methods: We analysed records of working hours, night work and sickness absence for a cohort of 9226 employees in one hospital district in Finland between 2008 and 2019. The exposure time windows ranged from 10 to 180 days, and we used Cox's proportional hazards models with time-dependent exposures to analyse the associations between working-hour characteristics and subsequent sickness absence.

Results: Longer working hours for a period of 10 to 30 days was not associated with the risk of sickness absence whereas longer working hours for a period of 40 to 180 days was associated with a lower risk of sickness absence. Irrespective of exposure time window, night work was not associated with sickness absence. **Conclusions:** It is important to consider the length of exposure time window when examining

associations between long working hours and sickness absence, whereas the association between night work and sickness absence is not similarly sensitive to exposure times.

Peutere et al. 2022.

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

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Keywords: Exposure time; Night work; Nurses; Shift work; Sickness absence; Working hours.

Evidence Level: 5B

Link: <https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-021-07231-4>

Night work, rotating shift work, and the risk of cancer in Japanese men and women: The JACC study

Background: Limited epidemiological evidence has suggested a positive relationship between night shift work and the risk of cancer. Herein, we investigated the prospective association between different forms of work schedule and the risk of numerous cancers and all-cause cancer among Japanese men and women.

Methods: This cohort study included 45,390 working men and women aged 40-79 years and registered in the Japan Collaborative Cohort Study (JACC Study). The Cox proportional hazards models were used to calculate the hazard ratios (HRs) and their 95% confidence intervals (CIs) for incident cancer among those who reported engagement in night work and rotating shift work for their longest occupations compared with day work. **Results:** Within a median follow-up duration of 14.2 years, 2,283 (9.4%) men and 1,309 (4.5%) women developed cancer. Among men, rotating shift work was significantly associated with increased risk of esophageal cancer (HR 2.47; 95% CI, 1.42-4.31) and decreased risk of liver cancer (HR 0.54; 95% CI, 0.30-0.98). Also, rotating shift work tended to be associated with the increased risk of prostate cancer (HR 1.42; 95% CI, 0.95-2.12). Night work and rotating shift work were not related to the risk of all-cause cancer in either sex. **Conclusion:** Rotating shift work might contribute to the increased risk of esophageal cancer and prostate cancer and the decreased risk of liver cancer among Japanese men.

Arafa et al. 2022.

Journal of Epidemiology, vol. 31, no. 12.

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Keywords: Cohort study; Esophageal cancer; Liver cancer; Night work; Prostate cancer; Shift work.

Evidence Level: 4B

Link: https://www.jstage.jst.go.jp/article/jea/31/12/31_JE20200208/_article

Association of night shift work with Chronic Spontaneous Urticaria and effect modification by circadian dysfunction among workers

Background: Night shift work is common in the current working environment and is a risk factor for many diseases. The study aimed to explore the relationship between night shift work with chronic spontaneous urticaria (CSU), and the modification effect of circadian dysfunction on it. **Methods:** A cross-sectional survey was conducted among Chinese workers. Exposure was measured by night work history and duration. Circadian dysfunction was characterized by excessive daytime sleepiness (EDS). The diagnosis of CSU was made by dermatologists who were investigating on the spot. The effect size was expressed as odds ratios (ORs). **Results:** A total of 8,057 participants were recruited, and 7,411 (92%) with complete information were included in the final analyses. The prevalence rates of CSU for workers without night shift and those with night shift history were 0.73 and 1.28%, respectively. Compared with workers who never worked night shifts, the risk of CSU increased with the length of night shift work: OR = 1.55 (95% confidence interval [CI]: 0.78-3.06) for duration <5 years and OR = 1.91 (95% CI: 1.12-3.26) for duration ≥5 years. EDS s EDS has been shown to modify this combination. Among workers without EDS, there was no association between night shift and CSU (OR = 0.94; 95% CI: 0.49-1.79). Whereas, in participants with EDS, the correlation was significant (OR = 3.58; 95% CI: 1.14-11.20). However, the effect modification by sleep disturbance was not observed. **Conclusions:** Night shift work is a risk factor for CSU, and there is a dose-response relationship between night shift work hours and the risk of CSU. This connection may be modified by circadian dysfunction.

Huang et al. 2022.

Frontiers in Public Health, vol. 9.

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Keywords: Chronic spontaneous urticaria; Circadian dysfunction; Effect modification; Excessive daytime sleepiness; Night shift work.

Evidence Level: 4B

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2021.751579/full>

Effects of 2-hour nighttime nap on melatonin concentration and alertness during 12-hour simulated night work

Background: A nighttime nap is expected to mitigate melatonin suppression during night work by blocking light input to the retina, but it is unclear. **Methods:** In the present study, we investigated the effects of a nap break on melatonin level, subjective sleepiness, and vigilance performance during simulated night work. **Results:** Eleven healthy young males (mean \pm SD age: 22.2 \pm 4.1 years) participated in counterbalanced crossover design experiments with two conditions (nap vs. no nap). The subjects performed 12-hour simulated night work from 21:00 to 09:00 h (illuminance: ~500 lx). Subjects with a nap condition took a nap for 2 hours in a dark room from 03:00, while subjects with a no nap condition continued the simulated night work. The results showed that immediately after the 2-h nap break, the melatonin level at 05:00 h temporarily recovered from light-induced melatonin suppression during the simulated night work but significantly suppressed again at 07:00 and 09:00 h. Subjective alertness and vigilance performance were impaired immediately after the nap break but subsequently enhanced.

Conclusion: The results suggest that a single nap break for 2 hours could be a strategy to enhance alertness during the last part of night shift but inadequate for mitigating melatonin suppression.

Lee et al. 2022.

Industrial Health, vol. 59, no. 6.

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Keywords: Melatonin suppression; Night work; Nighttime nap; Subjective sleepiness; Vigilance performance.

Evidence Level: 3A

Link: https://www.istage.jst.go.jp/article/indhealth/59/6/59_2020-0245/_article

Shift work predicts increases in Lipopolysaccharide-Binding Protein, Interleukin-10, and Leukocyte counts in a Cross-Sectional Study of healthy volunteers carrying low-grade systemic inflammation

Background: The disruption of inflammatory responses is a potential mechanism behind the harmful effects of shift work and is associated with increased risk of hypertension, stroke, obesity, diabetes, and cancer. These responses are linked to the proliferation of leukocytes in shift workers, suggesting a systemic signal as a potential mediator. The purpose of this study was to assess the relationship between systemic inflammation, leukocyte counts, and systemic endotoxemia in samples from a diverse cohort of day workers and shift workers. **Methods:** Participants (normothermic and normotensive) were healthy volunteers, non-smoking, and drug- and medication-free. The following outcomes were measured: C-reactive protein, TNF- α , IL-6, IL-1 β , IL-10, leukocyte counts (monocytes, lymphocytes, and neutrophils), and lipopolysaccharide-binding protein (LBP). Risk factors that increase systemic inflammation, such as blood pressure, sleep loss, and cortisol, were also assessed. **Results:** The results indicated that shift workers slept significantly less than day workers and had significantly increased concentrations of all of the cytokines measured as well as plasma cortisol. Regression models found that after controlling for covariates, shift-work exposure predicted the significant increase observed in IL-10, leukocyte counts, and LBP. Our results suggest that acute increases in low-grade systemic endotoxemia are unresolved during chronic shift-work exposure. **Conclusion:** This ongoing immune challenge may underlie the disrupted inflammatory responses characteristic of shift-work-related pathologies. Systemic endotoxemia may represent a novel target to investigate the early effects of exposure to shift-work schedules.

Atwater et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 24.

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Keywords: Leukocyte proliferation; Lipopolysaccharide-binding protein; Low-grade systemic inflammation; Shift work; Systemic endotoxemia.

Evidence Level: 4A

Link: <https://www.mdpi.com/1660-4601/18/24/13158>

The effects of shift work on cardio-metabolic diseases and eating patterns

Background: Energy metabolism is tightly linked with circadian rhythms, exposure to ambient light, sleep/wake, fasting/eating, and rest/activity cycles. External factors, such as shift work, lead to a disruption of these rhythms, often called circadian misalignment. Circadian misalignment has an impact on some physiological markers. However, these proxy measurements do not immediately translate into major clinical health outcomes, as shown by later detrimental health effects of shift work and cardio-metabolic disorders. **Methods:** This review focuses on the effects of shift work on circadian rhythms and its implications in cardio-metabolic disorders and eating patterns. **Results:** Shift work appears to be a risk factor of overweight, obesity, type 2 diabetes, elevated blood pressure, and the metabolic syndrome. However, past studies showed discordant findings regarding the changes of lipid profile and eating patterns. Most studies were either small and short lab studies, or bigger and longer cohort studies, which could not measure health outcomes in a detailed manner. These two designs explain the heterogeneity of shift schedules, occupations, sample size, and methods across studies. **Conclusion:** Given the burden of non-communicable diseases and the growing concerns about shift workers' health, novel approaches to study shift work in real contexts are needed and would allow a better understanding of the interlocked risk factors and potential mechanisms involved in the onset of metabolic disorders.

Hemmer et al. 2022.

Nutrients, vol. 13, no. 11.

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Keywords: Cardiovascular disease; Circadian misalignment; Eating patterns; Metabolic disease; Shift work.

Evidence Level: 6A

Link: <https://www.mdpi.com/2072-6643/13/11/4178>

Night shift work and the risk of metabolic syndrome: Findings from an 8-year hospital cohort

Background: Studies concerning the risk of metabolic syndrome associated with night work have shown inconsistent findings, due to imprecise working time data and cross-sectional design. We used register-based daily working time data to examine the risk of incident metabolic syndrome associated with night shift work. **Methods:** Working time data collected between 2010 and 2018 of 5775 Taiwanese hospital workers were used to identify night shift workers and to calculate the number of night shifts. Metabolic syndrome was identified by annual occupational health examination results, which were linked to the working time data. Logistic regression models and generalized estimating equations were used to examine the association between night shift work and metabolic syndrome and the 5 components of metabolic syndrome. **Results:** Night shift work is associated with a higher risk of developing metabolic syndrome (adjusted OR = 1.36, 95% CI = 1.04 to 1.78) and high waist circumference (adjusted OR = 1.27, 95% CI = 1.07 to 1.78) compared to day work. Among night shift workers, increased number of night shifts was associated with high blood pressure (adjusted OR = 1.15, 95% CI = 1.01 to 1.31). **Conclusions:** Night shift work is associated with metabolic risk factors. Long-term effects of circadian rhythm disruption on metabolic disturbances needs to be further studied.

Cheng et al. 2022.

PLoS One, vol. 16, no. 12.

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Keywords: Shift work; Metabolic syndrome; Risk.

Evidence Level: 4B

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0261349>

Management and Leadership

Tracing an unyielding work compulsion: A moderated mediation model of abusive supervision and compulsory citizenship behavior

Background: We conceptualize and examine an integrated model of compulsory citizenship behavior in the employees of the insurance sector. For this purpose, direct and indirect influences of job demands (active-aggressive and passive-aggressive abusive supervisions) are examined on the compulsory citizenship behavior. In so doing, the relevance of perceived support of coworkers as a job resource and emotional exhaustion as an underlying mechanism is investigated. **Methods:** Data were collected from 205 managerial level employees working in the insurance sector of a developing economy. **Results:** Both aspects of abusive supervision have both direct and indirect effects through emotional exhaustion on compulsory citizenship behavior. Active-aggressive abusive supervision, coupled with low perceived support of the coworkers influences emotional exhaustion that culminates in increased compulsory citizenship behavior of employees. Interestingly, when perceived support of coworkers is high, the indirect link between active aggressive abusive supervision and compulsory citizenship behavior through emotional exhaustion decreases. For human resource managers, these findings imply that the proper background checks should be made before the recruitment so that employees with troubled past or tending to exhibit aggression can be screened. For line managers, these findings imply that coworkers can play a major role in curbing the compulsory citizenship behavior. **Conclusion:** Thus, managers should foster such organizational practices that can develop mutual trust and stronger relationship among coworkers so that coworkers can become the perfect source of psychological support.

Baig et al. 2022.

Frontiers in Psychology, vol. 29, no. 12.

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Keywords: Active-aggressive abusive supervision; Compulsory citizenship behavior (CCB); Emotional exhaustion; Passive-aggressive abusive supervision; Perceived co-worker support.

Evidence Level: 5A

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.746823/full>

Do organizational health climates and leader health mindsets enhance employees' work engagement and job crafting amid the pandemic?

Background: Although the COVID-19 pandemic has resulted in many health- and stress-related symptoms among employees, surprisingly few studies have assessed the effect of a health-promoting organizational climate or leadership on employee work outcomes. **Methods:** To fill this gap, our research proposed and tested a moderated mediation model involving perceived organizational health climate (POHC), leader health mindset (LHM), work engagement, and job crafting. Our propositions were tested using two-wave data collected from 301 South Korean employees. **Results:** As predicted, POHC was positively related to employees' job crafting, and this relationship was mediated by work engagement. Moreover, the positive relationship between POHC and work engagement and the indirect effect of POHC on job crafting through work engagement were more pronounced when LHM was high than when it was low. **Conclusion:** These findings support the job demands-resources model and social exchange theory and have implications for helping employees maintain their work attitudes and behavior in times of crisis.

Shin et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 22.

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Keywords: COVID-19; Job crafting; Leader health mindset; Organizational health climate; Work engagement.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/22/12123>

Security providing leadership: A job resource to prevent employees' burnout

Background: Leadership styles in work contexts play a role in employees' well-being, contributing to better health or, on the contrary, being a source of stress. **Methods:** In this study we propose that security providing leadership may be considered as a resource to prevent employees' job burnout. First, we examine the relationship between employees' perception of their leader's degree of security in providing leadership and the employees' degree of job-related burnout. Second, the underlying processes by which leaders as security providers exert their influence on burnout are analyzed with a focus on the mediating role of two variables: an organizational climate oriented to psychological safety and organizational dehumanization. **Results:** A total of 655 Spanish employees (53.7% women) completed a paper-and-pencil self-report questionnaire. To recruit participants, we employed an exponential non-discriminative snowball sampling. Results, using Partial Least Squares Structural Equation Modeling (PLS-SEM) to test hypotheses, show that security providing leadership was related negatively to burnout. Furthermore, psychological safety climate and organizational dehumanization mediated the relationship between security providing leadership and burnout. **Conclusion:** These findings support the attachment approach to leadership and open new avenues for creating better organizational environments. Security-providing leaders, by supporting employees and treating them in a personalized way, can enhance the psychological safety climate and prevent organizational dehumanization and consequent job burnout.

Moriano et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: Attachment theory; Burnout; Leadership; Organizational climate; Organizational dehumanization; Security provider.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/23/12551>

Work Ability

Immigrant status, gender and work disability duration: findings from a linked, retrospective cohort of workers' compensation and immigration data from British Columbia, Canada

Background: To compare differences in work disability durations of immigrant men and women injured at work to comparable Canadian-born injured workers in British Columbia, Canada. **Methods:** Data on accepted workers compensation claims and immigration status from 1995 and 2012 were used to compare the number of work disability days paid at the 25%, 50% and 75% for immigrant and Canadian-born injured workers stratified by gender and recency of immigration. **Results:** Immigrant workers comprised 8.9% (78 609) of the cohort. In adjusted quantile regression models, recent and established immigrant women received 1.3 (0.8, 1.9) and 4.0 (3.4, 4.6) more paid disability days at the 50% of the disability distribution than Canadian-born counterparts. For recent and established immigrant men, this difference was 2.4 (2.2, 2.6) and 2.7 (2.4, 4.6). At the 75%, this difference increased for recent immigrant men and established immigrant men and women but declined for recent immigrant women. **Conclusions:** Injured immigrants receive more work disability days than their Canadian-born counterparts except for recent immigrant women. Both immigrant status and gender matter in understanding health disparities in work disability after work injury.

Saffari et al. 2022.

BMJ Open, vol. 11, no. 12.

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Keywords: Epidemiology; Occupational & industrial medicine; Public health immigrant health.

Evidence Level: 4B

Link: <https://bmjopen.bmj.com/content/11/12/e050829.long>

The role of the employer in supporting work participation of workers with disabilities: A systematic literature review using an interdisciplinary approach

Background: There is growing awareness that the employer plays an important role in preventing early labor market exit of workers with poor health. This systematic review aims to explore the employer characteristics associated with work participation of workers with disabilities. An interdisciplinary approach was used to capture relevant characteristics at all organizational levels. **Methods:** To identify relevant longitudinal observational studies, a systematic literature search was conducted in PubMed, Web of Science, PsycINFO and EconLit. Three key concepts were central to the search: (a) employer characteristics, (b) work participation, including continued employment, return to work and long-term work disability, and (c) chronic diseases. **Results:** The search strategy resulted in 4456 articles. In total 50 articles met the inclusion criteria. We found 14 determinants clustered in four domains: work accommodations, social support, organizational culture and company characteristics. On supervisor level, strong evidence was found for an association between work accommodations and continued employment and return to work. Moderate evidence was found for an association between social support and return to work. On higher organizational level, weak evidence was found for an association between organizational culture and return to work. Inconsistent evidence was found for an association between company characteristics and the three work outcomes. **Conclusions:** Our review indicates the importance of different employer efforts for work participation of workers with disabilities. Workplace programs aimed at facilitating work accommodations and supervisor support can contribute to the prevention of early labor market exit of workers with poor health. Further research is needed on the influence of organizational culture and company characteristics on work participation.

Jansen et al. 2022.

Journal of Occupational Rehabilitation, vol. 31, no. 4.

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Keywords: Employment; People with disabilities; Return to work; Social support; Workplace.

Evidence Level: 1A

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-09978-3>

Workability in the ageing workforce-A population-based cross-sectional study

Background: The purpose of this study was to investigate the impact of age, musculoskeletal pain and ergonomic exposure on workability in the oldest group of workers. **Methods:** The study was a population based cross-sectional survey. The study population comprised citizens born between 1952-1966, living in Esbjerg municipality ultimo 2016 ($n = 23,463$). A questionnaire was sent electronically or by mail. The analysis included the working population only. A stereotype logistic regression was used with the primary dependent variable being workability and independent variables included age, musculoskeletal pain, and ergonomic exposure. **Results:** The response rate was 58% and the data demonstrated a significant negative association between age and workability. With excellent workability as a reference, the odds for poor workability increased by 97% being 60+ y compared to 50-55 y. Both moderate intensity and severe musculoskeletal pain in the back, shoulder and knee/hip all showed significantly higher odds for poor workability. Ergonomic exposures, such as standing/walking, working with back bent or twisted and carrying or lifting had a significant negative impact on workability. **Conclusion:** Age, musculoskeletal pain and ergonomic exposures showed a significant negative impact on workability in the oldest group of workers and should be targeted with preventive initiatives.

Nygaard et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: Aging; Ergonomic exposure; Musculoskeletal pain; Work demands.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/18/23/12656>

Changes in work ability after weight-loss surgery: Results of a longitudinal study of persons with morbid obesity before and after Bariatric Surgery

Background: Bariatric surgery is a life-changing treatment, but knowledge of its influence on changes in work ability is still limited. We hypothesized that self-reported work ability improves in response to surgery-induced weight loss and sociodemographical variables (e.g., age, sex, and marital status), and that psychosocial characteristics (e.g., depressive symptoms and dysfunctional eating) may have predictive value as to patients' work ability. **Methods:** A total of 200 participants scheduled for bariatric surgery were recruited between September 2015 and June 2018. They completed several self-report measures at the preoperative examination (t1) and at 6- (t2) and 12 months (t3) after bariatric surgery. A repeated-measures analysis of variance was calculated to detect any changes in the work ability and body mass index (BMI) among the 3 time points. Further, a hierarchical multiple regression analysis was used to determine whether any demographical and psychosocial characteristics at (t1) would predict work ability at (t3).

Results: Participants (82% of whom were women) were middle-aged and showed a BMI of nearly 46 at the preoperative medical examination. Excess weight loss at (t2) and at (t3) was 49 and 66%, respectively. Work ability increased toward a moderate level after weight-loss surgery. Work ability and dysfunctional eating at (t1) showed significant predictive value with respect to work ability at (t3). **Discussion:** The results suggest that weight-loss surgery has a positive impact on work ability, and indicate a predictive value for the extent of weight loss and dysfunctional eating behavior. Against our hypothesis and in contrast to former research, a predictive value for depressive symptoms and age was not revealed. Further research must show how interventions can support and maintain improvements in work ability after bariatric surgery, in order to reduce sick leave and unemployment in patients with preoperative morbid obesity.

Köhler et al. 2022.

Obesity Facts, vol. 8, no. 1-10.

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Keywords: Bariatric surgery; Body mass index; Obesity; Work ability.

Evidence Level: 4A

Link: <https://www.karger.com/Article/FullText/519269>

Adapting to the Future of Work

Aging Workforce

Association of mental demands in the workplace with cognitive function in older adults at increased risk for dementia

Background: Growing evidence suggests a protective effect of high mental demands at work on cognitive function in later life. However, evidence on corresponding associations in older adults at increased risk for dementia is currently lacking. This study investigates the association between mental demands at work and cognitive functioning in the population of the AgeWell.de-trial. **Methods:** Cross-sectional investigation of the association between global cognitive functioning (Montreal Cognitive Assessment) and mental demands at work in older individuals at increased risk for dementia (Cardiovascular Risk Factors, Aging, and Incidence of Dementia (CAIDE)score ≥ 9 ; n = 941, age: 60-77 years). Occupational information was matched to Occupational Information Network (O*NET)-descriptors. Associations between cognitive function and O*NET-indices executive, verbal and novelty were investigated using generalized linear models.

Results: Higher values of index verbal (b = .69, p = .002) were associated with better cognitive function when adjusting for covariates. No association was observed for indices executive (b = .37, p = .062) and novelty (b = .45, p = .119). Higher education, younger age, and employment were linked to better cognitive function, while preexisting medical conditions did not change the associations. Higher levels of depressive symptomatology were associated with worse cognitive function. **Conclusions:** Higher levels of verbal demands at work were associated with better cognitive function for older adults with increased dementia risk. This suggests an advantage for older persons in jobs with high mental demands even after retirement

and despite prevalent risk factors. Longitudinal studies are warranted to confirm these results and evaluate the potential of workplaces to prevent cognitive decline through increased mental demands.

Zülke et al. 2022.

BMC Geriatric, vol. 21, no. 1.

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Keywords: Cognition; Cognitive decline; Dementia; Mental demands; Occupation; Risk factors; Workplace.

Evidence Level: 4B

Link: <https://bmcgeriatr.biomedcentral.com/articles/10.1186/s12877-021-02653-5>

Age-differentiated leadership and healthy aging at work: Evidence from the early stages of the COVID-19 pandemic

Background: Little is known about the relative influence of age-differentiated leadership on healthy aging at work. Likewise, the age-conditional influence of age-differentiated leadership is understudied, and especially so in the context of the COVID-19 pandemic. **Methods:** Using a three-wave longitudinal study, we examined the role that age-differentiated leadership plays in the prediction of work ability, as measured three times over six months ($n = 1130$) during the early stages of the COVID-19 pandemic in Germany (i.e., December 2019, March 2020, and June 2020). **Results:** The results suggest that although there were no systematic changes in work ability on average, there was notable within-person variability in work ability over time. Additionally, we find that a balanced approach to age-differentiated leadership that considers the needs of both older and younger employees matters most and complements the positive influence of leader-member exchange for predicting within-person variability in work ability. We also find that older employees' work ability benefits from an approach to age-differentiated leadership that considers older employee's needs, whereas younger employees' work ability especially benefits from leader-member exchange and a balanced approach to age-differentiated leadership. **Conclusion:** Overall, these results provide initial support for the idea that an age-differentiated approach to leadership is important when considering healthy aging at work.

Kozziel et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: COVID-19; Age-differentiated leadership; Healthy aging; Work ability.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/23/12509>

Working life job strain status and cognitive aging in Europe: A 12-year follow-up study

Background: To examine the association of job strain with cognitive ability and the influence of life-course job strain on later life cognitive decline. **Methods:** Data were derived from six waves of the Survey of Health, Aging, and Retirement in Europe. The study sample consists of 13349 participants aged 50 to 98 years at wave 2 and has been followed up for 12-years. Job strain status across working life was assessed using a short demand-control job strain model containing two core dimensions: job demands and job control collected in wave 3. Cognitive abilities concerning episodic memory was assessed by immediate recall and delayed recall tests, executive function was evaluated by verbal fluency test collected in all waves (waves 2-7) except wave 3. Mixed-effects model was used to estimate working life job strain and its cumulative effect on cognitive decline. **Results:** Both passive and high strain jobs were associated with lower levels of cognitive ability (episodic memory and verbal fluency) in comparison with active job. Long exposure to active- or low strain-job was associated with higher cognitive ability whereas long exposure to passive job or moderate duration of high strain job was associated with lower cognitive ability. The rate of memory decline was positively related to moderate duration of passive job and negatively related to long-term exposure to low strain job. **Limitations:** Information on working conditions was based on self-reported recollections. **Conclusions:** Working life variation in job strain status and their duration may explain individual differences in cognitive ability in later life.

Zhuo et al. 2022.

Journal of Affective Disorders, vol. 295.

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Keywords: Cognitive ability; Cumulative effect; European; Job strain; Working life.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S0165032721009198?via%3Dihub>

Doing age in the workplace: Exploring age categorisation in performance appraisal

Background: Ageism in the manager-employee relationship is one of the main obstacles towards an age-inclusive workplace. Ageism in the labour market is rooted in the use of age as an organising principle of employment relations. This article contributes to the study of ageism in the workplace by investigating how stages of life, as normalised age categories, are mobilised through discursive practices in performance appraisals. **Methods:** Based on the analysis of video recordings of actual performance appraisal interviews at an Italian labour union, three discursive ways of 'doing age' - or of how age, as a constructed social category, is performed and enacted - were identified: quantification (e.g. number of years in the organisation), 'ageing within the organisation' and age-group membership identification (e.g. 'young' vs. 'old'). **Results:** The analysis suggests that stages of life categories and age attributes are 'done' in social interactions and employed by both employees and managers as shared culture to sustain ongoing organisational activities, thereby reproducing discriminatory age norms and stereotypes. **Conclusion:** The study demonstrates how the ordering power of the stages of life categories is situated in organisational culture and challenges the implementation of equal and inclusive workplace policies.

Previtali et al. 2022.

Journal of Aging Studies, vol. 59.

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Keywords: Age stereotypes; Ageism; Discursive gerontology; Job performance; Membership categorization analysis; Older workers; Social interaction.

Evidence Level: 6A

Link: <https://www.sciencedirect.com/science/article/pii/S0890406521000712?via%3Dihub>

Guiding and Supporting Mental Health and Wellbeing

Mental Health

Towards a better understanding of work participation among employees with common mental health problems: A systematic realist review

Background: Common mental health problems (CMHP) represent a major health issue and burden to employees and employers. Under certain conditions work contributes to wellbeing and participation of employees with CMHP. Promoting work participation is important, however the specific conditions in which work participation occurs is complex and largely unclear. This calls for a novel, realistic approach to unravel the complex relationship between outcomes, context and underlying mechanisms of work participation. **Methods:** In the present realist review, peer-reviewed studies conducted between 1995 and 2020 were systematically reviewed on the outcome measures 'stay at work' (SAW) and 'work performance' (WP). The database search from seven databases identified 2235 records, of which 61 studies met the selection criteria and methodological rigor. **Results:** The synthesis demonstrates how work participation is promoted by the following mechanisms and contextual factors: (i) organizational climate and leadership, (ii) social support, (iii) perceived job characteristics, (iv) coping styles, (v) health symptoms and severity, (vi) personal characteristics, and (vii) features of interventions. An explanatory framework, based on the Capability-for-Work model, presents a new set of capabilities leading to SAW and WP. **Conclusions:** This systematic realist review revealed mechanisms and contextual factors that promote both SAW and WP among employees with CMHP. These show how the organizational climate, social support in the work context, job characteristics and certain capabilities enable employees with CMHP to participate at work. Our contributions and practical implications are discussed, providing valuable insights for employers, professionals and researchers in the development of evidence-based interventions.

Van Hees et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 8.

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Keywords: Work participation; Employees; Mental health.

Evidence Level: 1A

Link: <https://www.sjweh.fi/article/4005>

From burnout to occupational depression: Recent developments in research on job-related distress and occupational health

Background: Job-related distress has been a focal concern in occupational health science. Job-related distress has a well-documented health-damaging and life-threatening character, not to mention its economic cost. **Methods:** In this article, we review recent developments in research on job-related distress and examine ongoing changes in how job-related distress is conceptualized and assessed. **Results:** By adopting an approach that is theoretically, empirically, and clinically informed, we demonstrate how the construct of burnout and its measures, long favored in research on job-related distress, have proved to be problematic. We underline a new recommendation for addressing job-related distress within the long-established framework of depression research. In so doing, we present the Occupational Depression Inventory, a recently developed instrument devised to assess depressive symptoms that individuals specifically attribute to their work. **Conclusion:** We close our paper by laying out the advantages of a paradigm shift from burnout to occupational depression.

Schonfield et al. 2022.

Frontiers in Public Health, vol. 10.

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Keywords: Maslach Burnout Inventory; Anxiety; Depression; Job-related distress; Occupational depression inventory; Occupational health science; Work stress and burnout.

Evidence Level: 6B

Link: <https://www.frontiersin.org/articles/10.3389/fpubh.2021.796401/full>

Mental health in mine workers: A literature review

Background: The mining environment is hazardous for worker's health. It can affect the mental health, triggering symptoms and diseases, such as anxiety, job stress, depression, sleep disorders, mental fatigue and other. The aim of this study was to describe and analyze the scientific literature about the mental health in mine workers and to summarize the findings. **Methods:** The method used was scoping review.

Results: The principal outcomes were the following: evidence in the last 12 years in the topic was focused in four themes 1) Psychological problems & personal factors (38.2%); 2) Psychosocial problems & health related factor (23.6%); 3) Well-being (21.1%) and 4) Physical problems & organization factors (17.1%). Several affections, symptoms, characteristics or disorders were inquired about mine worker's mental health, such as job strain, unsafety experiences, poor quality of sleep, non-subjective well-being, job dissatisfaction, social-relations conflict, risk of accidents and injuries, musculoskeletal disorders (MSDs), substance abuse, dangerous working conditions and demanding job organization, and so on. **Conclusion:** For those factors, Mining could expose to serious mental health problems to a part of their workers. It's necessary to deepen the elaboration of international policies and carry out more scientific research and suggestions to make programs on the topic.

Matamala Pizarro et al. 2022.

Industrial Health, vol. 59, no. 6.

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Keywords: Industrial Health; Mining; Occupational health; Occupational risk; Workers Health; Workplace health.

Evidence Level: 6A

Link: https://www.jstage.jst.go.jp/article/indhealth/59/6/59_2020-0178/_article

Occupational self-efficacy as a mediator in the reciprocal relationship between job demands and mental health complaints: A three-wave investigation

Background: The most recent version of the job demands-resources (JD-R) theory proposes that demanding working conditions and employee strain form a self-perpetuating loss cycle. By acknowledging that such cycles are detrimental for both employees and organizations, the present study aimed to contribute to enhancing the current scarce understanding regarding their explanatory mechanisms. For this purpose, it applied social cognitive theory to propose that occupational self-efficacy mediates the effects of two role stressors (i.e., role ambiguity and role conflict) on employee mental health complaints and vice versa. **Methods:** The hypothesized reciprocal mediation effects were tested using a three-wave full panel research design and a dataset of 917 (NT1 = 513, NT1+T2 = 122, NT1+T3 = 70, NT1+T2+T3 = 212) Croatian employees working in heterogeneous private sector industries. **Results:** The results demonstrated that role conflict, but not role ambiguity, undermined employees' beliefs in their capabilities to successfully master their jobs which, in turn, led them to experience more mental health complaints over time. Contrary to expectations, poor mental health did not lead to diminished efficacy beliefs nor, in turn, more job demands over time. Overall, the results of this study demonstrated an additional mechanism in the job demands-strain relationship and, at the same time, shed new light on the role of personal resources within the JD-R theory. **Conclusion:** Accounting for the malleable nature of employee efficacy beliefs, the study proposes several ways in which organizations can enhance occupational self-efficacy and thereby curb the causal chain linking job demands and employee strain reactions.

Tomas. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 21.

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Keywords: Job demands; Job demands-resources theory; Longitudinal study; Mediation; Mental health; Occupational self-efficacy; Social cognitive theory.

Evidence Level: 6B

Link: <https://www.mdpi.com/1660-4601/18/21/11532>

Precarious work increases depression-based disability among male employees

Background: Precarious employment is a potent occupational health risk, but little is known about its association with work-related disability and its causes. This study analyzes whether employment precariousness is associated with receiving disability pension (DP) due to depression and whether this differs according to gender. **Methods:** Statistics Finland's Quality of Work Life Surveys (1997, 2003, 2008 and 2013) were merged with register-based DP data obtained from the Finnish Centre for Pensions. The survey material was used to measure employment precariousness using five variables: fear of job loss, poor employability prospects, previous unemployment, low earnings and temporary contracts. We followed 20-60-year-old employees until 2016 and studied Cox proportional hazard ratios (HRs) for receiving DP among women and men, adjusting for sociodemographic covariates, working conditions and health at baseline.

Results: The overall risk of receiving DP tended to increase as precarious job features accumulated. Among men, a higher risk of receiving DP due to depression was associated with previous unemployment [HR 2.2, 95% confidence interval (CI) 1.1-4.2] and poor employability (HR 2.4, 95% CI 1.3-4.7), whereas no corresponding association was found among women. **Conclusions:** Employment precariousness may reflect a psychological stress mechanism that predisposes the individual to mental health problems, predicting future disability. Work disability risk shows gendered differences depending on the cause of DP. Promoting employability at workplace and policy levels could offset the health risks associated with precariousness.

Pyöriä et al. 2022.

European Journal of Public Health, vol. 31, no. 6.

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Keywords: Depression; Disability; Male workers; Precarious employment.

Evidence Level: 4B

Link: <https://academic.oup.com/eurpub/article/31/6/1223/6319855>

Evaluation of a web-based stress management program for persons experiencing work-related stress in Sweden (My Stress Control): Randomized controlled trial

Background: Stress is one of the most common reasons for sick leave. Web-based interventions have the potential to reach an unlimited number of users at a low cost and have been shown to be effective in addressing several health-related problems. Handling stress on an individual level is related to behavior change. To support behavioral changes in stress management, My Stress Control (MSC) was developed. The development of MSC was based on several health psychology theories and models; however, central in the development were Social Cognitive Theory, Theory of Reasoned Action, Theory of Planned Behavior, Transactional Theory of Stress and Coping, and the Transtheoretical Model and Stages of Change. MSC is a fully automated program. The program is tailored to the user's specific needs for stress management and behavior change. **Objective:** In this study, we aim to conduct a randomized controlled trial to evaluate the extent to which MSC affects perceived stress in persons experiencing work-related stress. **Methods:** This was a randomized controlled trial with 2 arms. Study participants were recruited by visiting the worksites and workplace meetings. Participants were assigned to the intervention or wait-list group. Web-based questionnaires were used before and after the intervention to collect data. Perceived stress measured using the Perceived Stress Scale-14 was the primary outcome measurement. Analyses were conducted for both between-group and within-group changes. **Results:** A total of 92 participants were included in this study: 48 (52%) in the intervention group and 44 (48%) in the wait-list group. Overall, 25% (12/48) of participants in the intervention group and 43% (19/44) of participants in the wait-list group completed the postintervention assessment. There were no significant effects on perceived stress between the intervention and wait-list groups or within the groups. A small effect size (Cohen $d=0.25$) was found when comparing mean change over time on the primary outcome measure between the intervention and wait-list groups. In addition, a small effect size was found between pre- and postintervention assessments within the intervention group (Cohen $d=0.38$) as well as within the wait-list group (Cohen $d=0.25$). **Conclusions:** The effect of MSC on perceived stress remains uncertain. As adherence was low in the intervention group, elements or features that facilitate adherence and engagement must be further developed before firmer conclusions regarding the effect of MSC can be made.

Eklund et al. 2022.

JMIR Mental Health, vol. 8, no. 12.

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Keywords: Behavior change; Behavior medicine; Internet; Stress prevention.

Evidence Level: 2B

Link: <https://mental.jmir.org/2021/12/e17314/>

Working conditions and antidepressant medication use: A prospective study among 18 to 39-year-old municipal employees

Background: This study aimed to examine the associations of perceived physical and mental working conditions with subsequent antidepressant medication purchases among 18-39-year-old municipal employees. **Methods:** Survey data collected in 2017 among employees of the City of Helsinki ($n=5897$, response rate 51.5%) were linked to register data on psychotropic medication purchases (82% gave permission to register linkage). The analysis included 3570 women and 972 men. We used three single-item measures of working conditions: perceived mental and physical strenuousness of work, and time spent in physical work. Covariates included age, gender, marital status, employment status, body mass index, smoking, alcohol use and previous medication. Cox regression analysis was used to calculate hazard ratios (HR) for the first antidepressant medication (ATC class N06A) purchase during a one-year follow-up. **Results:** Those with mentally strenuous work (HR 1.85) as well as those spending more than four hours in physical work per workday (HR 1.60) had an statistically significantly increased risk of antidepressant medication use when adjusting for age and gender. Further adjustments for covariates attenuated these associations, which however remained statistically significant. **Conclusion:** Improving working conditions to avoid excess mental and physical workload is likely to be beneficial for preventing mental health problems already among younger employees.

Lahti et al. 2022.

Psychiatry Research, no. 305.

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Keywords: Depression; Mental health; Work demands; Young adults; Young employees.

Evidence Level: 4B

Link: [https://linkinghub.elsevier.com/retrieve/pii/S0165-1781\(21\)00509-6](https://linkinghub.elsevier.com/retrieve/pii/S0165-1781(21)00509-6)

Bullying and Harassment

Mental health problems as a risk factor for workplace bullying: The protective effect of a well-functioning organization

Background: This study examined a strain-stressor association, when mental health problems may lead to subsequent workplace bullying, and a mechanism of how this can happen. I hypothesized that the association between mental health problems and bullying depends on the perceived role clarity and order in the organization, and that sickness presenteeism (SP) mediates this association. **Methods:** The study is based on a longitudinal probability sample drawn from the total number of employees in Sweden.

Workplace bullying, mental health, SP, and role clarity and order in the organization were assessed using a questionnaire. **Results:** The results showed that mental health problems are associated with an increased risk for subsequent bullying, consistent with previous findings. However, this risk depends on the level of role clarity and order in the organization. The results also show a partial indirect effect via SP. This means that if one has mental health problems and persists in coming to work although one should have stayed at home, the risk of bullying increases. The indirect effect depends also on the level of order in the organization. **Conclusion:** The findings suggest that individual deficits, such as mental health problems, are associated with subsequent bullying only if organizational deficits are also present.

Rosander. 2022.

Annals of Work Exposures and Health, vol. 65, no. 9.

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Keywords: Longitudinal data; Mental health; Probability sample; Role clarity; Sickness presenteeism; Work environment hypothesis; Workplace bullying.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8577230/>

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

Background: 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.

Rudkjoebing et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 47, no. 8.

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Keywords: Workplace violence; Threats; Depression; Exposure.

Evidence Level: 4B

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

Psychosocial Issues

Falling in love with work: The effect of enterprise social media on thriving at work

Background, Methods and Results: Using a survey of 300 employees in different types of enterprises and different positions, this study verified that the use of enterprise social media has a positive effect on employees' work exuberance. The study separately examined the effects of social media applications for work tasks and social tasks. Both types of applications had a positive impact on employees' work exuberance. The study also identified the mediating role of challenge and obstructive stressors in this relationship. Work-related social media applications enhanced employees' exuberance by reducing obstructive stressors, and social-related social media applications enhanced employees' exuberance by reducing challenge stressors. **Conclusion:** The implications of these findings are that managers should pay attention to the use of enterprise social media, especially for social tasks, as this can enhance employees' sense of exuberance.

Liu et al. 2022.

Frontiers in Psychology, vol. 15.

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Keywords: Challenge stressors; Enterprise social media; Obstructive stressors; The social embeddedness model; Thriving at work.

Evidence Level: 5A

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.769054/full>

Psychological capital and family satisfaction among employees: Do occupational stressors moderate the relationship?

Background :The COVID-19 pandemic has created more occupational stressors, particularly work-family interface issues. The purpose of this study was to investigate the moderating role of occupational stressors in the relationship between a personal resource (psychological capital) and family satisfaction. **Methods:** A cross-sectional study was carried out with a sample of 787 employees (367 males, 420 females) from the Greater Bay Area of China between October and November 2020. Participants completed an online survey which included the Chinese version of the Psychological Capital Questionnaire, measures of occupational stressors from the Work Stress Management DIY Kit and a measure of family satisfaction. **Results:** Latent moderated structural equation modeling revealed that family satisfaction was positively associated with psychological capital and negatively associated with occupational stressors. Furthermore, occupational stressors weakened the positive association between psychological capital and family satisfaction.

Conclusion: These findings provided empirical evidence for the work-home resources model and may suggest that it would be beneficial to boost psychological capital and reduce occupational stressors of employees.

Siu et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 22.

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Keywords: Family; Occupational stress; Positive psychology.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/18/22/12260>

Family-to-work interface and workplace injuries: The mediating roles of burnout, work engagement, and safety violations

Background: Past research has primarily investigated the role of the negative side (family-to-work conflict; FWC) of the family-to-work interface in workplace safety outcomes and neglected the positive side (family-to-work enrichment; FWE). Moreover, the mechanism underlying the relation between the family-to-work interface and workplace safety has not been well studied. From the perspectives of the job demands-resources model as well as conservation of resources theory, this study endeavors to extend the current literature on workplace safety by evaluating the mediating roles of burnout, work engagement, and safety violations in the associations of FWC and FWE with workplace injuries. **Methods:** Two-wave longitudinal survey data were obtained from 233 Chinese employees in two high-risk industries (nursing and railways). The hypothesized longitudinal mediation model was analyzed with the structural equation modeling technique. **Results:** It was revealed that the association of FWE with workplace injuries was mediated by work engagement and then safety violations. Burnout was found to mediate the association of FWC with workplace injuries. Safety violations were also found to mediate the association of FWC with workplace injuries. **Conclusion:** The present findings offer insights into the underlying mechanisms by which the family-to-work interface influences workplace injuries.

Siu et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 22.

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Keywords: Burnout; Family-to-work interface; Safety violations; Work engagement; Workplace injuries.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/18/22/11760>

Occupational stress and work engagement among military police officers

Background: This paper investigates the levels of occupational stress and work engagement among military police officers. **Methods:** This cross-sectional, descriptive, and analytical study was conducted with 268 police officers from the 3rd Military Police Battalion of Paraná state. **Results:** We observed significant levels of occupational stress in 125 (46.7%) police officers. The main stressors were lack of career growth prospects (3.7; ± 1.3); inadequate training (3.4; ± 1.2); discrimination/favoritism in the work environment (3.1; ± 1.4); long working hours (3.0; ± 1.4); distribution of tasks (2.7; ± 1.1); control type (2.7; ± 1.1); gaps in disclosing information about organizational decisions (2.7; ± 1.2); low valuation (2.7; ± 1.2). Levels of work engagement ranged from 3.8 [medium] to 4.1 [high]. The correlation between occupational stress and work engagement was low for the dimensions of Absorption ($r: -.284$; $p < 0.001$) and Overall Score ($r: -.393$; $p < 0.001$) and moderate for the dimensions Vigor ($r: -.422$; $p < 0.001$) and Dedication ($r: -.414$; $p < 0.001$). **Conclusion:** We concluded that an important number of police officers had shown occupational stress. However, they displayed good levels of work engagement and are enthusiastic, inspired, and proud of their work.

Santos et al. 2022.

Ciência & Saúde Coletiva, vol. 26, no. 12.

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Keywords: Stress; Work engagement; Police.

Evidence Level: 4B

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

Psychosocial factors at work from the job strain model and preventable mortality in France: The STRESSJEM prospective study

Background: The study aimed to explore the prospective associations between psychosocial factors at work from the job strain model and preventable mortality, including smoking- and alcohol-related mortality as well as external causes of death. **Methods:** The study was based on prospective data and relied on a sample of 1,511,456 individuals for which data on job history, mortality and causes of death were linked over the 1976-2002 period. Exposures were the factors from the job strain model imputed through a job-exposure matrix. Various time-varying measures of exposure were used including current exposure and two measures of cumulative exposure. Preventable mortality was defined using the OECD/Eurostat list of

preventable causes of death. The associations between exposures and outcomes were studied using Cox proportional hazards models. Effect modification by gender was also assessed. **Results:** Over the study period, 57,264 preventable deaths occurred before the age of 75 years. Low decision latitude, low social support, job strain, iso-strain, passive job, and high strain were associated with preventable mortality, and associations of stronger magnitude were found for job strain and isostrain among men. Stronger associations were observed for alcohol-related mortality than for smoking-related mortality and external causes of death. The fractions of preventable mortality attributable to current exposure to job strain and isostrain were significant among men only (5.1% and 3.3%). Psychosocial factors at work from the job strain model may play a role on preventable mortality. **Conclusion:** Intensifying research and prevention towards the psychosocial work environment may be helpful to reduce risky health-related behaviours and related mortality.

Niedhammer et al. 2022.

Preventative Medicine, vol. 153.

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Keywords: Alcohol-related mortality; Cumulative exposure; External causes of death; Job stress; Preventable mortality; Psychosocial work factors; Smoking-related mortality.

Evidence Level: 4B

Link: <https://www.sciencedirect.com/science/article/pii/S0091743520302024?via%3Dihub>

Work-family enrichment: Influence of job autonomy on job satisfaction of knowledge employees

Background: In order to explore the specific path of the influence of job autonomy on the satisfaction of knowledge employees, the current study deduced and established a Chain Mediation Model, which was based on the Resource-Gain-Development Model and the Conservation of Resources Theory. **Methods:** Primary data were gathered through questionnaire surveys at several cities in China by using a professional platform named "Wenjuanxing." The target populations were employees with a bachelor's degree or above, who were engaged in higher knowledge content and have mastered certain professional knowledge and skills, including technical R & D personnel, management personnel, professionals (such as accountants, lawyers, and medics) and other personnel generally recognized by the academic community. In order to improve the reliability of the sample and reduce the error caused by regional differences, the questionnaires were disseminated to involve as many cities in China as possible, such as Tianjin, Beijing, Chengdu, Wuhan, and Guangzhou. SPSS24.0 and Amos24.0 were used as multivariate data analysis tools for statistical analysis. **Results:** The results showed that job autonomy can significantly improve the satisfaction of knowledge employees; however, it cannot affect the satisfaction of knowledge employees through self-efficacy. **Conclusion:** The findings of the study also revealed that job autonomy has a positive impact on both resource source domain satisfaction and resource acceptance domain satisfaction through work-family enrichment, especially the positive emotions in the resource source domain. Job autonomy improves the self-efficacy of knowledge employees, which, in turn, improves their overall satisfaction through the work-family enrichment path.

Jing et al. 2022.

Frontiers in Psychology, vol. 12.

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Keywords: Conservation of resources theory; Job autonomy; Knowledge employees; Satisfaction; Self-efficacy; Work-family enrichment.

Evidence Level: 5B

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.726550/full>

Digitalisation and employees' subjective job quality in the second half of working life in Germany

Background: Since digitalisation alters occupational task profiles via automation processes, job quality is also likely to be affected. While existing literature mainly focusses on objective job quality, this study asks if and how digitalisation is associated with employees' subjective job quality in the second half of working life in Germany. **Methods:** Analyses are based on the German Ageing Survey 2014. Our sample includes n = 1541 employees aged 40-65 years who are subject to social insurance contributions. Subjective job quality

is operationalised with regards to job satisfaction and perceived occupational stress in general, and ten aspects of job quality in detail. Digitalisation is approximated by substitution potentials of occupations. We control the association for compositional effects in the workforce, as well as for the moderating effect of perceived job insecurity. **Results:** The results indicate that digitalisation is predominantly beneficial but also unfavourable in a few other respects for employees' subjective job quality. The higher the degree of digitalisation, the higher is the employee's general job satisfaction on average; for general perceived occupational stress, we find no significant association. **Conclusion:** Regarding single aspects of subjective job quality, employees working in more digitalised occupations are found to report on average higher satisfaction with working hours and earnings, and lower levels of stress due to tight schedules. However, they also report higher levels of stress due to negative environmental factors.

Kortmann et al. 2022.

Social Indicators Research, vol. 1, no. 1-11.

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Keywords: Digitalisation; German Ageing Survey; Job satisfaction; Occupational stress; Subjective job quality.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8635314/>

Does sex in managerial positions really matter? Differences in work-related feelings and behaviors

Background: The aim of the current study was to test hypotheses regarding differences in work-related feelings (i.e., dejection, anxiety, anger, and happiness) and behaviors (aggressive, avoidance-passive, and proactive) between males and females, managers and non-managers, and male and female managers.

Methods: This survey-based study included a total of 3019 respondents, consisting of 502 managers and 2517 employees working in non-managerial positions. Data were collected using two questionnaires developed by the authors: the scale of work-related affective feelings (WORAF) and the scale of work-related behaviors (WORAB). **Results:** The results revealed significant differences between managers and non-managers, with managers being happier in their jobs and exhibiting more proactive behaviors.

However, there were no differences in work-related feelings or work-related behaviors between males and females in the total sample of respondents or in the group of employees holding managerial positions.

Conclusion: In terms of work-related feelings and behaviors, there are no sex differences among working people. However, some differences between managers and non-managers were observed.

Jaworek et al. 2022.

Psychology Research and Behavior Management, vol. 16.

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Keywords: Bayesian approach; Gender differences; Managers; Non-managers; Work-related affective states; Work-related behavior strategies.

Evidence Level: 5A

Link: <https://www.dovepress.com/does-sex-in-managerial-positions-really-matter-differences-in-work-rel-peer-reviewed-fulltext-article-PRBM>

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 the 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) (ie, pre-existing conditions) were included (n = 3,090). 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 a 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 also 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. 2022.

Journal of Epidemiology, vol. 31, no. 12.

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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/31/12/31_JE20210146/_article

Enabling Healthy and Safe Workplaces

Health and Wellbeing

Working cancer survivors' physical and mental characteristics compared to cancer-free workers in Japan: a nationwide general population-based study

Background: This study compared working cancer survivors' self-rated health status (SRHS), physical functional capacity, depressive symptoms, and happiness to those of cancer-free workers. **Methods:** A nationwide general population-based cross-sectional study on a sample of Japanese was conducted. Prevalence of deteriorated SRHS, restricted physical functional capacity, depressive symptoms, and perceived happiness were compared between working cancer survivors and cancer-free workers with multivariable logistic regression analysis adjusted for age and sociodemographic and health-related backgrounds. **Results:** Of the 28,311 male and 26,068 female workers, 977 (3.5%) and 1267 (4.9%) were cancer survivors, respectively. Working cancer survivors reported deteriorated SRHS more frequently than cancer-free workers: 21.3% vs. 13.8%, multivariable-adjusted odds ratio (95% confidence interval), 1.64 (1.39-1.95) for men, 23.8% vs. 17.5%, 1.34 (1.16-1.54) for women. Restricted physical functional capacity was reported more frequently in working cancer survivors than cancer-free workers: 6.8% vs. 2.6%, 1.76 (1.34-2.32) for men, 4.9% vs. 2.0%, 2.06 (1.56-2.71) for women. No significant difference was found for depressive symptoms: 21.6% vs. 22.9% in men, 30.0% vs. 28.5% in women. Working cancer survivors felt happiness more frequently than cancer-free survivors in men (77.3% vs. 71.7%, 1.21 (1.01-1.45)) but not in women (76.1% vs. 74.9%). **Conclusions:** Working cancer survivors had worse SRHS and more restricted physical functional capacity than cancer-free workers. In men, working cancer survivors felt happiness more frequently than cancer-free workers.

Ota et al. 2022.

Journal of Cancer Survivorship, vol. 15, no. 6.

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Keywords: Cancer survivors; Depressive symptoms; Happiness; Physical functional capacity; Self-rated health status; Work.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs11764-020-00984-7>

Work related well-being is associated with individual subjective well-being

Background and Methods: This study utilizes Gallup-ShareCare Well-being Index data to investigate the association between work-related well-being, i.e., job satisfaction, and overall subjective well-being among US workers. Subjective well-being is measured by i) daily positive and negative emotional experiences - happiness, smiles, enjoyment, sadness, anger, worry, and stress (hedonic well-being); and ii) current and future life evaluation (evaluative well-being). **Results:** The study finds significant positive relationships between job satisfaction and subjective well-being both in terms of higher odds of positive hedonic experiences and increased life evaluation scores after controlling for covariates and other nonwork-related contributors to well-being. Job satisfaction accounted for a 14% increase in current and an 8% increase in future life evaluation scores. The results emphasize that not only the income generated by work but the

quality of work is also important for worker well-being. In fact, those without a job had higher well-being than those workers who are dissatisfied at work. **Conclusion:** This is probably the first study that relates work-related well-being to overall well-being, using a nationally representative sample of US workers. Further, this is one of the few instances where the subjective measure of well-being is used in the occupational safety and health literature.

Ray. 2022.

Industrial Health, vol. 4.

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Keywords: Evaluative; Gallup; Hedonic; Job satisfaction; Unemployment; Well-being; Work.

Evidence Level: 5B

Link: https://www.jstage.jst.go.jp/article/indhealth/advpub/0/advpub_2021-0122/_article

Effort-reward imbalance at work and drug misuse: Evidence from a National Survey in the U.S

Background: With the rise of drug misuse among workers in recent years, preliminary research on potential risk factors in the workplace of single-type of drug misuse has been reported. This is the first study to examine cross-sectional associations of work stress, in terms of effort-reward imbalance, with multiple drug misuse (including any drug misuse, opioid misuse, sedatives misuse, cannabis misuse, and other drug misuse) during the past 12 months in a national sample of U.S. workers. **Methods:** Data of 2211 workers were derived from the nationally representative and population-based Midlife in the United States (MIDUS) study. Internal consistency reliability and factorial validity of a 17-item effort-reward imbalance measure were robust and satisfactory. **Results:** After adjustment for relevant covariates, logistic regression analyses showed that workers experiencing effort-reward imbalance at work had significantly higher odds of any drug misuse (OR and 95% CI = 1.18 (1.03, 1.37)), especially opioid misuse (OR and 95% CI = 1.35 (1.07, 1.69)) and other drug misuse (OR and 95% CI = 1.36 (1.01, 1.83)). **Conclusion:** The findings suggest that a stressful work environment may act as a determinant of drug misuse, and further prospective evidence is needed.

Li et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 24.

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Keywords: Cannabis; Drug misuse; Effort–reward imbalance; Opioid; Work stress; Workers.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/24/13334>

The association of workplace smoke-free policies on individual smoking and quitting-related behaviours

Background: Our study aims to provide information about workplace smoke-free (SF) policy coverage in mainland China and to assess the relationship between workplace SF policies and secondhand smoke (SHS) exposure, current smoking, smoking harm awareness and quitting intention among smokers. **Method:** Data from the 2018 Asia Best Workplace Mainland China programme were used to address these aims. This cross-sectional study included 14,195 employees from the 2018 survey and 14,953 employees from the 2019 survey. Logistic regression with year-fixed effects was applied to these data. The dependent variables were SHS exposure, smoking or smoking harm awareness. The explanatory variable was the SF workplace policy. **Results:** A total of 21,275 participants (73.0%) reported working under SF policies. The overall prevalence of smoking and SHS exposure were 20.3% and 52.5%, respectively. The workplace SF policy was significantly associated with lower SHS exposure (OR: 0.48, 95% CI: 0.45-0.51), lower current smoking employees (OR: 0.81, 95% CI: 0.76-0.87) and higher awareness of smoking harm (OR: 1.76, 95% CI: 1.61-1.91). However, workplace SF policy was not significantly associated with quitting intention (OR: 0.99, 95% CI: 0.84-1.16). **Conclusion:** Our study identified that although most companies had established workplace SF policies, the overall prevalence of SHS exposure remained very high. Workplace SF policy is associated with lower SHS exposure, lower overall current smoking and higher awareness of smoking harm. These findings provide valuable evidence to promote such policies in all workplaces.

Lin et al. 2022.

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

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Keywords: Smoke-free policies; Smoking; Quitting; Workplace policy.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12395-z>

Association between preventive measures against workplace infection and preventive behavior against personal infection

Background: To prevent the spread of infection, it is necessary for each individual to adopt infection prevention behavior. We investigated the effect of infection control measures implemented in the workplace on personal infection prevention behavior. **Methods:** We conducted a self-administered questionnaire survey through the Internet from December 22 to 25, 2020, during which period coronavirus disease 2019 (COVID-19) was spreading. Among respondents aged 20 to 65 years (n=27,036), 21,915 workers were included in the analysis. **Results:** The results showed that as the number of infection control measures in the workplace increased, implementation of infection prevention behavior by individuals also significantly increased. However, the relationship differed depending on the type of personal infection prevention behavior. Specifically, infection control measures against COVID-19 in the workplace may affect personal infection prevention behavior. **Conclusion:** Implementation of infection control measures in the workplace increases awareness of the importance of individual infection prevention behavior and its implementation by all individuals. These findings may be applicable not only to COVID-19 measures but also to responses to other emerging infections and seasonal influenza.

Kawasumi et al. 2022.

Industrial Health, vol. 16.

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Keywords: COVID-19; Infection control measures; Pandemic; Personal infection prevention behavior; Workplace.

Evidence Level: 5A

Link: https://www.jstage.jst.go.jp/article/indhealth/advpub/0/advpub_2021-0162/_article

Well-balanced lunch reduces risk of lifestyle-related diseases in middle-aged Japanese working men

Background: Based on the results of a previous WHO-CARDIAC study, this study was designed to test the effect of the daily consumption of a diet rich in potassium with optimal salt content, rich in fish meat and soy isoflavones, corresponding to the ingredients of a traditional Japanese diet. The test meals were a Balanced Lunch (BL) with chicken as the main dish and a Fortified Lunch (FL) with fish and soy as the main dish, which appeared the same. **Methods:** A double-blind, randomized controlled trial was conducted in 64 relatively obese men (47.2 ± 5.5 years old) who consumed the lunch at their work site for 4 weeks. All participants underwent fasting blood sampling, 24-h urine collection, as well as measurements of height, weight, and blood pressure before and after the intervention. **Results:** Body mass index, blood pressure, and HbA1c were significantly improved and a 3-g reduction of salt intake was proven by 24-h urine collection in both groups. Moreover, HDL cholesterol and the Atherogenic Index (AI) were significantly improved in the FL group. **Conclusion:** In conclusion, the risks of lifestyle-related diseases in working men were reduced by one meal per day intervention of optimally-salted traditional Japanese diets containing soy and fish nutrients with high vegetable ingredients.

Mori 2022.

Nutrients, vol. 13, no. 12.

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Keywords: DHA; Atherogenic index; Lunch intervention; Nutritional biomarkers of 24-h urine; Optimal salt; Sodium/potassium ratio; Soy isoflavones.

Evidence Level: 2B

Link: <https://www.mdpi.com/2072-6643/13/12/4528>

Pneumococcal pneumonia among shipyard workers: Inside the features of disease onset

Background: Several outbreaks of pneumococcal pneumonia among shipyard workers have been described. In this study, following a previous report of grouped cases, we aimed to elucidate the features of disease onset. **Methods:** We compared the population characteristics of shipyard workers with a confirmed diagnosis of pneumococcal pneumonia (N = 38) to those of workers without pneumonia (N = 53). We compared nine *S. pneumoniae* strains isolated from patients with pneumonia by capsular serotyping, multi-locus sequence typing, and whole genome sequencing. **Results:** Shipyard workers with *Streptococcus pneumoniae* pneumonia were more frequently from Italy (P = 0.016), had at least one underlying condition (P = 0.024), lived on-board the ship (P = 0.009). None of these factors was independent by multivariate analysis. While capsular serotyping enabled us to identify four different serotypes: 4 (n = 5), 8 (n = 2), 9 N (n = 1), and 3 (n = 1), by sequence typing, we distinguished five sequence types (STs): ST801 (n = 4), ST205 (n = 2), ST1220 (n = 1), ST1280 (n = 1), and ST66 (n = 1). Whole genome sequencing confirmed the results obtained by MLST. Genomes of isolates of the same sequence type were similar with ≤80 single-nucleotide polymorphisms. **Conclusions:** We confirmed that the onset of pneumococcal infection among shipyard workers was attributable to both a person-to-person spread of single strains of *S. pneumoniae* and a shift of different strains from commensal to pathogen under favourable conditions (professional exposure, viral infections). Control measures should therefore be implemented by taking into account these features.

Cassir et al. 2022.

Travel Medicine and Infectious Disease, vol. 44.

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Keywords: Pneumonia; Shipyard workers; *Streptococcus pneumoniae*; Whole-genome sequencing.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S1477893921002246?via%3Dihub>

The impact of musculoskeletal injuries sustained in road traffic crashes on work-related outcomes: A systematic review

Background: Musculoskeletal injuries occur frequently after road traffic crashes (RTCs), and the effect on work participation is not fully understood. The primary aim of this review was to determine the impact of sustaining a musculoskeletal injury during an RTC on the rate of return to work (RTW), sick leave, and other work outcomes. The secondary aim was to determine factors associated with these work-related outcomes. **Methods:** An electronic search of relevant databases to identify observational studies related to work and employment, RTC, and musculoskeletal injuries was conducted. Where possible, outcome data were pooled by follow-up period to answer the primary aim. **Results:** Fifty-three studies were included in this review, of which 28 were included in meta-analyses. The pooled rate of RTW was 70% at 1 month, 67% at 3 months, 76% at 6 months, 83% at 12 months, and 70% at 24 months. Twenty-seven percent of participants took some sick leave by one month follow-up, 13% by 3 months, 23% by 6 months, 36% by 12 months, and 22% by 24 months. **Conclusion:** Most of the factors identified as associated with work outcomes were health-related, with some evidence also for sociodemographic factors. While 70% of people with RTC-related musculoskeletal injury RTW shortly after accident, many still have not RTW two years later.

Gane et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 21.

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Keywords: Musculoskeletal injury; Occupational rehabilitation; Return to work; Traffic accidents.

Evidence Level: 1A

Link: <https://www.mdpi.com/1660-4601/18/21/11504>

Risk assessment of metabolic syndrome prevalence involving sedentary occupations and socioeconomic status

Background: To determine whether occupation type, distinguished by socioeconomic status (SES) and sedentary status, is associated with metabolic syndrome (MetS) risk. **Methods:** We analysed two data sets covering 73 506 individuals. MetS was identified according to the criteria of the modified Adult Treatment

Panel III. Eight occupational categories were considered: professionals, technical workers, managers, salespeople, service staff, administrative staff, manual labourers and taxi drivers; occupations were grouped into non-sedentary; sedentary, high-SES; and sedentary, non-high-SES occupations. A multiple logistic regression was used to determine significant risk factors for MetS in three age-stratified subgroups. R software for Windows (V.3.5.1) was used for all statistical analyses. **Results:** MetS prevalence increased with age. Among participants aged ≤ 40 years, where MetS prevalence was low at 6.23%, having a non-sedentary occupation reduced MetS risk (OR=0.88, $p<0.0295$). Among participants aged >60 years, having a sedentary, high-SES occupation significantly increased (OR=1.39, $p<0.0247$) MetS risk. **Conclusions:** The influence of occupation type on MetS risk differs among age groups. Non-sedentary occupations and sedentary, high-SES occupations decrease and increase MetS risk, respectively, among younger and older adults, respectively. Authorities should focus on individuals in sedentary, high-SES occupations.

Chen et al. 2022.

BMJ Open, vol. 11, no. 12.

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Keywords: Health informatics; Health policy; Other metabolic; Porphyria; Public health; Risk management.

Evidence Level: 4B

Link: <https://bmjopen.bmj.com/content/11/12/e042802.long>

Work Health and Safety

Global, regional and national burden of disease attributable to 19 selected occupational risk factors for 183 countries, 2000-2016: A systematic analysis from the WHO/ILO Joint Estimates of the Work-related Burden of Disease and Injury

Background: We provide a brief introduction to the objectives, data, methods and results of the World Health Organization (WHO)/International Labor Organization (ILO) Joint Estimates of the Work-related Burden of Disease and Injury (WHO/ILO Joint Estimates), which estimated the burden attributable to 19 selected occupational risk factors. **Methods:** The WHO/ILO Joint Estimates were produced within the global Comparative Risk Assessment framework, which attributes the burden of one specific health outcome (i.e., disease/injury) to a specific occupational risk factor. For 39 established occupational risk factor-health outcome pairs, estimates are produced using population attributable fractions (PAF) from recent burden of disease estimates. For two additional pairs, PAF are calculated from new databases of exposure and risk ratios produced in WHO/ILO systematic reviews. Attributable disease burdens were estimated by applying the PAF to total disease burdens. **Results:** Globally in 2016, it is estimated that 1.88 [95% uncertainty range (UR) 1.84-1.92] million deaths and 89.72 (95% UR 88.61-90.83) million disability-adjusted life years were attributable to the 19 selected occupational risk factors and their health outcomes. A disproportionately large work-related burden of disease is observed in the WHO African Region (for disability-adjusted life years), South-East Asia Region, and Western Pacific Region (for deaths), males and older age groups. **Conclusions:** The WHO/ILO Joint Estimates can be used for global monitoring of exposure to occupational risk factors and work-related burden of disease and to identify, plan, cost, implement and evaluate policies, programs and actions to prevent exposure to occupational risk factors and their associated burden.

Pega et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 22.

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Keywords: Burden; Disease; Occupational risk; Disease burden and injury.

Evidence Level: 5A

Link: <https://www.sjweh.fi/article/4001>

Timing of health service use among truck drivers after a work-related injury or illness

Background: Timely delivery of treatment and rehabilitation is generally acknowledged to support injury recovery. This study aimed to describe the timing of health service use by injured truck drivers with work-related injury and to explore the association between demographic and injury factors and the duration of health service use. **Methods:** Retrospective cohort study of injured truck drivers with accepted workers'

compensation claims in the state of Victoria, Australia. Descriptive analyses examined the percentage of injured truck drivers using health services by service type. Logistic regression model examined predictors of any service use versus no service use, and predictors of extended service use (≥ 52 weeks) versus short-term use. **Results:** The timing of health service use by injured truck drivers with accepted workers' compensation claims varies substantially by service type. General practitioner, specialist physician, and physical therapy service use peaks within the 14 weeks after compensation claim lodgement, whilst the majority of mental health services were accessed in the persistent phase beyond 14 weeks after claim lodgement. Older age, being employed by small companies, and claiming compensation for mental health conditions were associated with greater duration of health service use. **Conclusions:** Injured truck drivers access a wide range of health services during the recovery and return to work process. Delivery of mental health services is delayed, including for those making mental health compensation claims. Health service planning should take into account worker and employer characteristics in addition to injury type.

Xia et al. 2022.

Journal of Occupational Rehabilitation, vol. 31, no. 4.

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Keywords: Health service use; Occupational injury recovery; Truck driver; Work-related injury and illness.

Evidence Level: 4A

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-10001-y>

Association of occupational distress and low sleep quality with syncope, presyncope, and falls in workers

Background: Syncope and presyncope episodes that occur during work could affect one's safety and impair occupational performance. Few data are available regarding the prevalence of these events among workers. The possible role of sleep quality, mental stress, and metabolic disorders in promoting syncope, presyncope, and falls in workers is unknown. **Methods:** In the present study, 741 workers (male 35.4%; mean age 47 ± 11 years), employed at different companies, underwent clinical evaluation and blood tests, and completed questionnaires to assess sleep quality, occupational distress, and mental disorders. The occurrence of syncope, presyncope, and unexplained falls during working life was assessed via an ad hoc interview. **Results:** The prevalence of syncope, presyncope, and falls of unknown origin was 13.9%, 27.0%, and 10.3%, respectively. The occurrence of syncope was associated with an increased risk of occupational distress (adjusted odds ratio aOR: 1.62, confidence intervals at 95%: 1.05-2.52), low sleep quality (aOR: 1.79 CI 95%: 1.16-2.77), and poor mental health (aOR: 2.43 CI 95%: 1.52-3.87). Presyncope was strongly associated with occupational distress (aOR: 1.77 CI 95%: 1.25-2.49), low sleep quality (aOR: 2.95 CI 95%: 2.08-4.18), and poor mental health (aOR: 2.61 CI 95%: 1.78-3.84), while no significant relationship was found between syncope or presyncope and metabolic syndrome. **Conclusion:** These results suggest that occupational health promotion interventions aimed at improving sleep quality, reducing stressors, and increasing worker resilience might reduce syncope and presyncope events in the working population.

Magnavita et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: Effort reward imbalance; Health promotion; Loss of consciousness; Mental health; Sleep disorders; Working life; Workplace.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/23/12283>

The impact of adverse employment and working conditions on the risk of workplace injury in Canada

Background: Employment standards (ES) include having a regular payday, regular breaks, the right to paid sick or vacation time, and paid wages. Inadequate ES contribute to the labour market vulnerability of workers; however, they are not typically considered to be risk factors for workplace injury. In a sample of Canadian workers, we examine the risk of injury associated with inadequate ES, independent of, and combined with inadequate workplace protections from workplace hazards. **Methods:** Data from 2,803 adults working 15 hours or more/week in workplaces with at least five employees were analysed. We explored associations between exposure to workplace hazards with inadequate protections [termed occupational health and safety (OHS) vulnerability] and inadequate ES on workplace injury (physical or

mental injury; injury requiring time off). Additive interaction models were used to examine the independent and combined effects of these exposures. **Results:** Occupational health and safety vulnerability and inadequate ES were independently associated with increased injury outcomes. Adjusted models showed an additive relationship for all injury outcomes between OHS vulnerability and inadequate ES. Statistically significant superadditive relationships were observed for physical injury risk with policy and procedure vulnerability plus inadequate ES [synergy index (S) 1.50, 95% CI: 1.13-2.00] and for overall OHS vulnerability *plus* inadequate ES (S 1.53, 95% CI: 1.16-2.02), suggesting a combined effect greater than independent effects. **Conclusion:** Occupational health and safety vulnerability and inadequate ES are independently associated with workplace injury. For certain injury outcomes, the combined effect of OHS vulnerability and inadequate ES is greater than the independent effects of each individual exposure.

Nadalin et al. 2022.

Safety and Health at Work, vol. 12, no. 4.

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Keywords: Employment standards; Occupational health; Occupational safety; Vulnerability; Work injury.

Evidence Level: 5B

Link: [https://linkinghub.elsevier.com/retrieve/pii/S2093-7911\(21\)00055-X](https://linkinghub.elsevier.com/retrieve/pii/S2093-7911(21)00055-X)

Research on the tournament incentive mechanism of the safety behavior for construction workers:

Considering multiple heterogeneity

Background: The unsafe behavior of construction workers is one of the most important and direct causes of safety accidents. Managers usually develop effective incentives aimed at regulating worker safety behavior. Due to the large number of workers in construction projects, there are multiple differences in fairness preference, risk preference and ability level, which will lead to the complex effect of the traditional mechanism to regulate workers' safety behavior. In order to improve the effectiveness of incentive measures for worker safety behavior, this paper takes into account the multiple differences of individual workers' fairness preference, risk preference and ability level, based on the tournament mechanism to construct a competition incentive model. By designing a tournament reward and salary distribution for heterogeneous workers, the occurrence of unsafe behaviors can be reduced. **Conclusion:** The study found that in terms of the optimal level of safety investment, workers with risk aversion attitude generally invest higher than that of workers with risk preference, no matter whether they have a strong fairness preference or not; In terms of the distribution of tournament rewards, workers with a risk aversion attitude and a higher level of fairness preference need to be given higher incentives.

Ji et al. 2022.

Frontiers in Psychology, vol. 12.

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Keywords: Construction workers; Multiple heterogeneity; Risk appetite; Safety behavior; Tournament incentive mechanism.

Evidence Level: 6B

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.796295/full>

Physical work conditions and disparities in later life functioning: Potential pathways

Background: Research in the US on the social determinants of reduced physical functioning at older ages has typically not considered physical work conditions as contributors to disparities. **Methods:** We briefly describe a model of occupational stratification and segregation, review and synthesize the occupational health literature, and outline the physiological pathways through which physical work exposures may be tied to long-term declines in physical functioning. The literature suggests that posture, force, vibration, and repetition are the primary occupational risk factors implicated in the development of musculoskeletal disorders, through either acute injuries or longer-term wear and tear. Personal risk factors and environmental and structural work characteristics can modify this association. In the long-term, these musculoskeletal disorders can become chronic and ultimately lead to functional limitations and disabilities that interfere with one's quality of life and ability to remain independent. We then use data on

occupational characteristics from the Occupational Information Network (O*NET) linked to the 2019 American Community Survey (ACS) to examine disparities among sociodemographic groups in exposure to these risk factors. Occupations with high levels of these physical demands are not limited to those traditionally thought of as manual or blue-collar jobs and include many positions in the service sector.

Results: We document a steep education gradient with less educated workers experiencing far greater physical demands at work than more educated workers. There are pronounced racial and ethnic differences in these exposures with Hispanic, Black, and Native American workers experiencing higher risks than White and Asian workers. Occupations with high exposures to these physical risk factors provide lower compensation and are less likely to provide employer-sponsored health insurance, making it more difficult for workers to address injuries or conditions that arise from their jobs. **Conclusion:** In sum, we argue that physical work exposures are likely an important pathway through which disparities in physical functioning arise.

Andrasfay et al. 2022.

SSM Population Health, vol. 4, no. 16.

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Keywords: Disability; Disparities; Musculoskeletal disorders; Physical functioning; Work; Working conditions.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S2352827321002652?via%3Dihub>

Defining a "Safe System of Work"

Background: Providing a "safe system of work" is the essence of the general duties that employers have to their employees under workplace health and safety regulations. Despite this, consistent and appropriate definition of what constitutes a safe system of work is almost non-existent. Available definitions tend to confuse a safe system of work with management practices intended to bring about a safe system, or conflate the broad system suggested in general duties clauses with procedures or work methods that are focused on particular hazards or tasks. **Results:** This article develops a definition of safe systems of work which recognises the broad scope of the concept and includes psychological health and return to work processes. **Conclusion:** This definition can be used by a range of stakeholders to better communicate the scope of occupational health and safety duties and more consistently assess whether a safe system has been provided both before and after incidents occur.

Caponecchia et al. 2022.

Safety and Health at Work, vol. 12, no. 4.

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Keywords: Psychological health; Safe system of work; System.

Evidence Level: 6A

Link: [https://linkinghub.elsevier.com/retrieve/pii/S2093-7911\(21\)00054-8](https://linkinghub.elsevier.com/retrieve/pii/S2093-7911(21)00054-8)

The effectiveness of hearing protection devices: A systematic review and meta-analysis

Background: To prevent intensive noise exposure in advance and be safely controlled during such exposure, hearing protection devices (HPDs) have been widely used by workers. The present study evaluates the effectiveness of these HPDs, partitioned into three different outcomes, such as sound attenuation, sound localization, and speech perception. **Methods:** Seven electronic journal databases were used to search for published articles from 2000 to 2021. Based on inclusion criteria, 20 articles were chosen and then analyzed. For a systematic review and meta-analysis, standardized mean differences (SMDs) and effect size were calculated using a random-effect model. The funnel plot and Egger's regression analysis were conducted to assess the risk of bias. **Results:** From the overall results of the included 20 articles, we found that the HPD function performed significantly well for their users (SMDs: 0.457, 95% confidence interval (CI): 0.034-0.881, $p < 0.05$). Specifically, a subgroup analysis showed a meaningful difference in sound attenuation (SMDs: 1.080, 95% CI: 0.167-1.993, $p < 0.05$) when to wear and not to wear HPDs, but indicated no significance between the groups for sound localization (SMDs: 0.177, 95% CI: 0.540-0.894, $p =$

0.628) and speech perception (SMDs: 0.366, 95% CI: -0.100-1.086, $p = 0.103$). The HPDs work well for their originally designated purposes without interfering to find the location of the sound sources and for talking between the workers. **Conclusion:** Taking into account various factors, such as the characteristics of the users, selection of appropriate types, and fitting methods for wearing in different circumstances, seems to be necessary for a reliable systematic analysis in terms of offering the most useful information to the workers.

Kwak et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 21.

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Keywords: Communication; Hearing protection; Noise-induced hearing loss; Sound attenuation; Sound localization.

Evidence Level: 1A

Link: <https://www.mdpi.com/1660-4601/18/21/11693>

Co-creating an Occupational Health Intervention within the construction industry in Sweden: Stakeholder Perceptions of the Process and Output

Background: One way to prevent work-related stress, is to implement primary occupational health interventions aimed at improving the psychosocial work environment. However, such interventions have shown a limited effect, often due to implementation failure and poor contextual fit. Co-creation, where researchers, together with end-users and other relevant stakeholders, develop the intervention is increasingly encouraged. However, few studies have evaluated the effects of co-created interventions, and participants' experience of the co-creation process. This is one of the first studies evaluating stakeholder perceptions of co-creating an occupational health intervention. **Methods:** We applied a thematic analysis, with data from 12 semi-structured interviews with stakeholders involved in the co-creation. **Results:** Our results show that the respondents, in general, were satisfied with engaging in the co-creation, and they reported an increased awareness regarding risk factors of stress and how these should be handled. Additionally, the respondents described trust in the intervention activities and a good fit into the context.

Conclusion: The study indicates that co-creating occupational health interventions can enhance the implementation and the contextual fit.

Cedstrand et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 24.

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Keywords: Co-creation; Implementation; Occupational health intervention; Psychosocial work environment; Stress.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/24/12872>

Risk Assessment

How does accelerometry-measured arm elevation at work influence prospective risk of long-term sickness absence?

Background: Elevated arm work is prevalent in many jobs. Feasible device-based methods are available to measure elevated arm work. However, we lack knowledge on the association between device-measured elevated arm work and prospective risk of long-term sickness absence (LTSA). We aimed to investigate this association. **Methods:** At baseline, 937 workers wore accelerometers on the right arm and thigh over 1-5 workdays to measure work time spent with elevated arms in an upright position. Between baseline and 4-year prospective follow-up in the national registers, we obtained information on the individuals' first event of LTSA (≥ 6 consecutive weeks). We performed compositional Cox proportional hazard analyses to model the association between work time with arm elevation $>30^\circ$, $>60^\circ$, or $>90^\circ$ and the probability of LTSA.

Results: Workers spent 21% of their work time with $>30^\circ$ arm elevation, 4% with $>60^\circ$ arm elevation, and 1% with $>90^\circ$ arm elevation; in the upright body position. We found a positive dose-response association between work time spent with elevated arm work and the risk of LTSA. Specifically, we found that

increasing two minutes of work time spent with arm elevation at (i) $>90^\circ$ increased the risk of LTSA by 14% [hazard ratio (HR) 1.14, 95% confidence intervals (95% CI 1.04-1.25)] (ii) $>60^\circ$ increased the LTSA risk by 3% (HR 1.03, 95% CI 1.03-1.06), and (iii) $>30^\circ$ increased the LTSA risk by 1% (HR 1.01, 95% CI 1.00-1.02).

Conclusion: Device-measured elevated arm work is associated with increased prospective LTSA. This information ought to be brought into preventive workplace practice by accessible and feasible device-based methods of elevated arm work.

Gupta et al. 2022.

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

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Keywords: Elevated arm work; Sickness absence; Work influence perspective.

Evidence Level: 5B

Link: <https://www.sjweh.fi/article/4000>

Chronic Health Issues

Effects of alcohol consumption and smoking on the onset of hypertension in a long-term longitudinal study in a male workers' cohort

Background: To determine the effects of alcohol consumption and smoking on the onset of hypertension in a long-term longitudinal study. **Methods:** 7511 non-hypertensive male workers were enrolled. This cohort study was performed over an 8-year period using the results of the annual workers-health screening. The end-point was defined as systolic blood pressure ≥ 140 mmHg, diastolic blood pressure ≥ 90 mmHg, or use of antihypertensive drugs. For alcohol consumption, weekly alcohol intake (g ethanol/week) was estimated (1 "gou" = 22 g ethanol). Annual survey data were analyzed by pooled logistic regression that included alcohol consumption, smoking, age, body mass index, job schedule types, habitual exercise, and blood test measurements into the statistical model. **Results:** A significant positive dose-response relationship between alcohol consumption and onset of hypertension was observed, with synergistic health effects present. Compared with abstainers and nonsmokers, the adjusted odds ratios (95% confidence interval) for the onset of hypertension were: 1.51 (1.27-1.79) for 154 g ethanol/week and nonsmokers, and 1.81 (1.54-2.11) for 154 g ethanol/week and smokers. An interaction between alcohol and smoking was confirmed. **Conclusions:** This study provided information useful to the prevention of hypertension. By reducing alcohol consumption and smoking simultaneously, the risk of hypertension may be considerably lowered.

Nagao et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 22.

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

Keywords: Alcohol consumption; Hypertension; Long-term longitudinal study; Pooled logistic regression analysis; Smoking; Workers' cohort.

Evidence Level: 4A

Link: <https://www.mdpi.com/1660-4601/18/22/11781>

Work absenteeism and disability associated with psoriasis and psoriatic arthritis in the USA - A retrospective study of claims data from 2009 to 2020

Background: To compare work absenteeism and short-term disability among adults with psoriasis or psoriatic arthritis (PsA), versus controls in the USA. **Methods:** Adults eligible for work absenteeism and/or short-term disability benefits between 1/1/2009 and 4/30/2020 were screened in the IBM® MarketScan® Commercial and Health and Productivity Management Databases. The following groups were defined: (1) psoriasis: ≥ 2 psoriasis diagnoses ≥ 30 days apart and no PsA diagnoses; (2) PsA: ≥ 2 PsA diagnoses ≥ 30 days apart; (3) control: absence of psoriasis and PsA diagnoses. Controls were matched to psoriasis and PsA patients based on age, gender, index year, and comorbidities. Non-recreational work absences and sick leaves were evaluated in absentee-eligible patients, and short-term disability was evaluated in short-term disability-eligible patients. Costs (in 2019 USD) associated with each type of work absence were evaluated. **Results:** 4261 psoriasis and 616 PsA absentee-eligible and 25,213 psoriasis and 3480 PsA short-term disability-eligible patients were matched to controls. Average non-recreational work absence costs were

\$1681, \$1657, and \$1217 for the PsA, psoriasis, and control group, respectively. Compared with psoriasis patients and controls, more PsA patients had sick leaves after 1 year (56.2% versus 55.6% and 41.5%, $p < 0.0001$). Similarly, short-term disability was more frequent in PsA patients than psoriasis patients and controls at year one (8.8% versus 5.6% and 4.7%, $p < 0.0001$) and corresponding costs were higher (\$605, \$406, and \$335 on average, $p < 0.0001$). **Conclusion:** Annual work absenteeism and short-term disability were consistently greater among patients with PsA and psoriasis than controls, highlighting the substantial economic burden of psoriatic disease.

Orbai et al. 2022.

Clinical Rheumatology, vol. 40, no. 12.

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Keywords: Psoriasis; Psoriatic arthritis; Short-term disability; Work absenteeism.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs10067-021-05839-9>

Working with Type 1 Diabetes: Investigating the associations between Diabetes-related distress, burnout, and job satisfaction

Background: The present study investigates the association between diabetes-related distress (DD) and work outcomes (burnout and job satisfaction) among employed people with type 1 diabetes. **Methods:** Employed adults with type 1 diabetes ($N = 297$) completed an online survey. Measures assessed emotional, social, food- and treatment-related DD, burnout, and job satisfaction, as well as the type of insulin treatment. We conducted multiple regression analyses to test our hypotheses. **Results:** Emotional DD was significantly and positively associated with burnout. Social DD was significantly and negatively associated with job satisfaction. The type of treatment (insulin pen versus insulin pump) had no significant effect on the outcomes. **Conclusion:** This study sets the stage for research on the interactions between working conditions, work outcomes and illness symptoms, and problems of people with type 1 diabetes, and, generally, employees with chronic illnesses. The findings have implications for individual health and illness management, burnout prevention, and occupational health measures.

Cook et al. 2022.

Frontiers in Psychology, vol. 4, no. 12.

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Keywords: Burnout; Chronic illness; Diabetes mellitus; Distress; Job satisfaction.

Evidence Level: 5A

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.697833/full>

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

Background: 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. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 47, no. 8.

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Keywords: Working conditions; Chronic inflammation; Employees; Stress.

Evidence Level: 1A

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

Effectiveness of workplace-based diet and lifestyle interventions on risk factors in workers with Metabolic Syndrome: A systematic review, meta-analysis and meta-regression

Background: Workplace health interventions are essential to improve the health and well-being of workers and promote healthy lifestyle behaviours. **Methods:** We carried out a systematic review, meta-analysis and meta-regression of articles measuring the association between workplace dietary interventions and MetS risk. We recovered potentially eligible studies by searching MEDLINE, the Cochrane Library, Embase, Scopus and Web of Science, using the terms "Metabolic syndrome" and "Occupational Health". **Results:** A total of 311 references were retrieved and 13 documents were selected after applying the inclusion and exclusion criteria. Dietary interventions were grouped into six main types: basic education/counselling; specific diet/changes in diet and food intake; behavioural change/coaching; physical exercise; stress management; and internet/social networks. Most programmes included several components. The interventions considered together are beneficial, but the clinical results reflect only a minimal impact on MetS risk. According to the metaregression, the interventions with the greatest impact were those that used coaching techniques and those that promoted physical activity, leading to increased HDL (effect size = 1.58, sig = 0.043; and 2.02, 0.015, respectively) and decreased BMI (effect size = -0.79, sig = -0.009; and -0.77, 0.034, respectively). In contrast, interventions offering information on healthy habits and lifestyle had the contrary effect, leading to increased BMI (effect size = 0.78, sig = 0.006), systolic blood pressure (effect size = 4.85, sig = 0.038) and diastolic blood pressure (effect size = 3.34, sig = 0.001). **Conclusion:** It is necessary to improve the efficiency of dietary interventions aimed at lowering MetS risk in workers.

Gea Cabrera et al. 2022.

Nutrients, vol. 13, no. 12.

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Keywords: Diet; Food and nutrition; Metabolic syndrome; Occupational health; Systematic review; Workplace.

Evidence Level: 1A

Link: <https://www.mdpi.com/2072-6643/13/12/4560>

Occupational Exposure

Occupational exposure to ultrafine particles and placental histopathological lesions: A retrospective study about 130 cases

Background: Ultrafine particles (UFPs) are particles smaller than 100 nanometers that are produced unintentionally during human activities or natural phenomena. They have a higher biological reactivity than bigger particles and can reach the placenta after maternal exposure. One study has shown an association between maternal occupational exposure to UFPs and fetal growth restriction. Yet few studies have focused on the effects of UFP exposure on placental histopathological lesions. **Methods:** The aim of this study was to investigate the association between maternal occupational exposure to UFPs and histopathological lesions of their placenta. The analyses were based on data from the ARTEMIS Center. A job-exposure matrix was used to assess occupational exposure to UFPs. The histopathological placental exam was performed by two pathologists who were blinded to the exposure of each subject. The examination was conducted in accordance with the recommendations of the Amsterdam consensus.

Results: The study sample included 130 placentas (30 exposed, 100 unexposed). Maternal occupational exposure to UFPs during pregnancy is significantly associated with placental hypoplasia (the phenomenon

affected 61% of the exposed patients and 34% of the unexposed ones, $p < 0.01$). **Conclusion:** Further research is needed to explain its pathophysiological mechanisms.

Pasquiou et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: Nanoparticles; Occupational exposure; Particulate matter; Pathology; Placenta.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/23/12719>

Occupational cold exposure is associated with increased reporting of airway symptoms

Background: To determine if exposure to cold environments, during work or leisure time, was associated with increased reporting of airway symptoms in the general population of northern Sweden.

Methods: Through a population-based postal survey responded to by 12627 subjects, ages 18-70, living in northern Sweden, the occurrence of airway symptoms was investigated. Cold exposure during work or leisure time was self-reported on numerical rating scales. Binary logistic regression was used to determine the statistical association between cold exposure and airway symptoms. **Results:** For currently working subjects ($N = 8740$), reporting any occupational cold exposure was associated to wheeze (OR 1.3; 95% CI 1.1-1.4); chronic cough (OR 1.2; 95% CI 1.1-1.4); and productive cough (OR 1.3; 95% CI 1.1-1.4), after adjusting for gender, age, body mass index, daily smoking, asthma, and chronic obstructive pulmonary disease. Leisure-time cold exposure was not significantly associated to reporting airway symptoms.

Conclusions: Occupational cold exposure was an independent predictor of airway symptoms in northern Sweden. Therefore, a structured risk assessment regarding cold exposure could be considered for inclusion in the Swedish workplace legislation.

Stjernbrandt et al. 2022.

International Archives of Occupational and Environmental Health, vol. 94, no. 8.

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Keywords: Asthma; Chronic obstructive pulmonary disease; Cold exposure; Cough; Occupational exposure; Sweden.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007%2Fs00420-021-01694-y>

Relationship between lead absorption and iron status and its association with oxidative stress markers in lead-exposed workers

Background: The emission of lead (Pb) occurring during the extraction, processing and industrial applications of this element remains a significant environmental risk factor. The absorbability of lead in humans is strongly associated with the general health status of exposed individuals. Existing mineral deficiencies are considered being a predisposition to an increased Pb uptake. Both, iron deficiency and lead poisoning are the major causative factors responsible for the prevalence of anemia within the vulnerable population, especially in children. Although some of the intervention programs of counteracting lead poisoning by iron supplementation proved to be effective in the Pb-exposed population, the exact mechanisms of this interaction still require further studies. The objective of the presented study was to examine the association of iron level on oxidative stress measures and its effects on the severity of lead toxicity in the exposed population. **Methods:** The analyzed population consisted of 270 male workers from the lead-zinc smelter. The studied population was divided into two sub-groups based on the serum iron concentration: low iron level group (L-Fe; $Fe < \text{median value}$) and high iron level group (H-Fe; $Fe > \text{median value}$). Measured traits comprised of blood lead (PbB), serum Fe and zinc protoporphyrin (ZPP) levels as well as a blood count and oxidative stress markers. **Results:** No significant correlation between serum iron concentration and PbB in the tested cohort was found. On the contrary, the analysis of ZPP levels (long-term marker related to a hematologic toxic effect of Pb) within the subgroups differing in serum Fe level shown that ZPP was 12.3 % lower ($p = 0.043$) in subjects classified within the H-Fe group. A positive correlation of serum Fe and total antioxidant capacity (TAC) was found ($R = 0.1999$). The conducted 3-D PCA analysis showed that individuals classified within the H-Fe group were characterized by the co-occurrence of higher Fe levels, lower ZPP, and higher TAC value. **Conclusion:** These results support the

existing evidence providing that maintaining the optimal status of Fe may play a significant role in preventing the lead poisoning and alleviating harmful effects of Pb on the oxidative balance in humans.

Slota et al. 2022.

Journal of Trace Elements and Medicine in Biology, vol. 68.

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Keywords: Blood lead; Iron status; Lead; Lead exposure; Oxidative stress; ROS.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0946672X21001310?via%3Dihub>

Occupational hearing loss associated with non-gaussian noise: A systematic review and meta-analysis

Background: Epidemiological characteristics of occupational noise-induced hearing loss (NIHL) associated with non-Gaussian noise are still unclear and have been rarely reported in the literature. **Methods:** The relationships between non-Gaussian noise exposure and occupational NIHL were analyzed based on the published papers. Systematic review and meta-analysis of epidemiological studies were performed.

Results: Of 78 epidemiological studies (47,814 workers) selected, there were seven cohort studies and 71 cross-sectional studies. The incidence of high-frequency NIHL (HFNIHL) and speech-frequency NIHL (SFNIHL) in the seven cohort studies was 10.9 and 2.9%, respectively. In 71 cross-sectional studies, the prevalence of HFNIHL and SFNIHL was 34.2 and 18.9%, respectively. The average hearing threshold level at the high frequencies was 42.1 ± 17.4 dB HL. Workers exposed to non-Gaussian noise had a higher risk of developing HFNIHL than those not exposed to noise (overall-weighted odds ratio [OR] = 4.46) or those exposed to Gaussian noise (overall-weighted OR = 2.20). The Chi-square trend test demonstrated that the prevalence of HFNIHL was positively correlated with age, cumulative noise exposure, and exposure duration ($p < 0.001$). **Conclusions:** Workers exposed to non-Gaussian noise suffered from greater NIHL than those exposed to Gaussian noise or not exposed to noise. Age, exposure duration, noise level, and noise temporal structure were the main risk factors for occupational NIHL. The A-weighted equivalent continuous sound pressure level (LAeq) is not a sufficient measurement metric for quantifying non-Gaussian noise exposure, and a combination of kurtosis and noise energy metrics (e.g., LAeq) should be used. It is necessary to reduce the exposure of non-Gaussian noise to protect the hearing health of workers.

Shi et al. 2022.

Ear and Hearing, vol. 42, no. 6.

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

Keywords: Hearing loss; Non-gaussian noise; Occupation.

Evidence Level: 1A

Link: https://journals.lww.com/ear-hearing/Fulltext/2021/11000/Occupational_Hearing_Loss_Associated_With.3.aspx

Working with environmental noise and noise-cancelation: A workload assessment with EEG and subjective measures

Background: As working and learning environments become open and flexible, people are also potentially surrounded by ambient noise, which causes an increase in mental workload. **Methods:** The present study uses electroencephalogram (EEG) and subjective measures to investigate if noise-canceling technologies can fade out external distractions and free up mental resources. Therefore, participants had to solve spoken arithmetic tasks that were read out via headphones in three sound environments: a quiet environment (no noise), a noisy environment (noise), and a noisy environment but with active noise-canceling headphones (noise-canceling). **Results:** Our results of brain activity partially confirm an assumed lower mental load in no noise and noise-canceling compared to noise test condition. The mean P300 activation at Cz resulted in a significant differentiation between the no noise and the other two test conditions. Subjective data indicate an improved situation for the participants when using the noise-canceling technology compared to "normal" headphones but shows no significant discrimination.

Conclusion: The present results provide a foundation for further investigations into the relationship

between noise-canceling technology and mental workload. Additionally, we give recommendations for an adaptation of the test design for future studies.

Pieper et al. 2022.

Frontiers in Neuroscience, vol. 1, no. 15.

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Keywords: EEG frequency; Ambient noise; Event-related potentials; Mental workload; Noise-canceling; Subjective measures.

Evidence Level: 3B

Link: <https://www.frontiersin.org/articles/10.3389/fnins.2021.771533/full>

Site-specific cancer risk following cobalt exposure via orthopedic implants or in occupational settings: A systematic review and meta-analysis

Background: In 2020, the European Commission up-classified metal cobalt as Class 1B Carcinogen (presumed to have carcinogenic potential) based primarily on data from rodent inhalation carcinogenicity studies. This up-classification requires an assessment under the Medical Device Regulations of cobalt cancer risk from medical devices. **Methods:** We performed a systematic review and meta-analysis to evaluate site-specific cancer risks with cobalt exposure from either total joint replacement (TJR) or occupational exposure (OC). Results were stratified by exposure type (OC or TJR), exposure level (metal-on-metal (MoM) or non-MoM), follow-up duration (latency period: <5, 5-10 or >10 years), and cancer incidence or mortality (detection bias assessment). **Results:** From 30 studies (653,104 subjects, average 14.5 years follow-up), the association between TJR/OC and cancer risk was null for 22 of 27 cancer sites, negative for 3 sites, and positive for prostate cancer and myeloma. Significant heterogeneity and large estimate ranges were observed for many cancer sites. No significant increase in estimates was observed by exposure level or follow-up duration. **Conclusion:** The current evidence, including weak associations, heterogeneity across studies and no increased association with exposure level or follow-up duration, is insufficient to conclude that there exists an increased risk for people exposed to cobalt in TJR/OC of developing site-specific cancers.

Holy et al. 2022.

Regulatory Toxicology and Pharmacology, vol. 10.

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Keywords: Cobalt; Joint prosthesis; Meta-analysis; Neoplasms; Occupational exposure; Risk.

Evidence Level: 1A

Link: [https://linkinghub.elsevier.com/retrieve/pii/S0273-2300\(21\)00237-3](https://linkinghub.elsevier.com/retrieve/pii/S0273-2300(21)00237-3)

Multiple chemical sensitivity in patients exposed to moisture damage at work and in general working-age population-The SAMDAW Study

Background: A considerable proportion of patients having respiratory tract or voice symptoms associated with workplace moisture damage (MD) could have multiple chemical sensitivity (MCS). MCS is characterized by symptoms of different organ systems in association with low-level chemical exposure. The objective of this study was to assess the prevalence of MCS among patients referred to secondary health care because of respiratory or voice symptoms associated with workplace MD compared to the general working-age population. **Methods:** Using three subscales of the QEESI© questionnaire, we assessed MCS in the study patients and 1500 controls in the same district randomly selected from the Finnish Population Information System. **Results:** Study patients had significantly more often high scores in chemical intolerance (39% vs. 23%, $p = 0.001$), symptom severity (60% vs. 27%, $p < 0.001$), and life impact subscales (53% vs. 20%, $p < 0.001$). Asthma, chronic rhinosinusitis, laryngeal problems, and atopy were not associated with the presence of MCS. **Conclusion:** MCS is common among patients referred to secondary health care with respiratory tract and/or voice symptoms associated with workplace MD, and it considerably affects their everyday life. MCS should be considered as a possible explanatory factor for MD-associated symptoms.

Nynäs et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: Chemical intolerance; Dampness; Moisture damage; Mold; Multiple chemical sensitivity (MCS).

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/18/23/12296>

Rheumatoid arthritis in silica-exposed workers

Background: Few studies have examined rheumatoid arthritis (RA) risk and severity in Korean workers exposed to silica. We compared the hospitalization risk of RA between silica-exposed workers and the general Korean population. **Methods:** The study cohort consisted of male workers exposed to silica who had undergone at least one silica-associated special medical examination between 1 January 2000 and 31 December 2004 (N = 149,948). The data were from the Korea Occupation Safety and Health Agency. RA morbidity based on hospital admission records was estimated from 2000 to 2005 using the Korea National Health Insurance Service claims data. The standardized admission ratio (SAR) was calculated by dividing the observed number of admissions in silica-exposed workers by the expected number of admissions in the general reference population. **Results:** For the sum of "Seropositive rheumatoid arthritis" (M05) and "Other rheumatoid arthritis" (M06), the SAR was higher in the silica-exposed group (1.34, 95% CI 1.08-1.64). For M05, workers with <10 years of silica exposure had a significantly higher SAR (2.54, 95% CI 1.10-5.01) than the general population. More silica-exposed workers without a diagnosis of pneumoconiosis were hospitalized for RA than the general population. **Conclusion:** Our analysis reaffirms the link between silica exposure and RA and suggests that the severity of RA is increased by silica. Further studies of silica-exposed workers with longer follow-up are needed.

Min et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: Cohort studies; Occupational exposure; Rheumatoid arthritis; Silica.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/18/23/12776>

Occupational stressors and work accidents among health workers

Background: To test the association between occupational stressors and work accidents due to exposure to biological material (ATbio) in health workers, considering the isolated and combined analysis of the dimensions of two models, the demand-control model (DCM) and the effort-reward imbalance model (ERI). **Methods:** Cross-sectional study in a representative sample of workers with higher, technical and secondary education, including health agents from primary and medium-complexity care units in five cities in Bahia. Random sampling was selected, stratified by geographic area, level of service complexity and occupation. The outcome variable was ATbio; The main exposure was occupational stressors, assessed by the DCM and ERI. Incidences and relative risks were estimated as a function of the acute, short-term nature of the outcome of interest. Associations between ATbio and isolated and combined DCM and ERI dimensions were tested. **Results:** A total of 3,084 workers participated in the study. The global incidence of ATbio was 3.4% and was associated with high psychological demand, high effort and high commitment to work, adjusted for sex, age, education and work shift. High-strain work and a situation of imbalance between efforts and rewards were associated with ATbio. With the combination of the models, an increase in the measure of association with the outcome was observed. Significant associations of greater magnitude were observed in the complete combined models. ATbio's risk was 5.23 times higher among those exposed in both complete models compared to the absence of exposure in both models. **Conclusions:** Occupational stressors were associated with ATbio. Advantages in using the combined models were observed. The approach of different psychosocial dimensions has expanded the ability to identify exposed groups, offering a solid basis for interventions for ATbio's prevention in health.

Gomes et al. 2022.

Revista de Saúde Pública, vol. 17.

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Keywords: Occupational stressors; Work accidents; Exposure; Biological material.

Evidence Level: 4A

Link: <https://www.scielo.br/j/rsp/a/FvzLtxQkK4RZCgybBwZwRm/?lang=en>

Perceptions of workplace heat exposure and adaption behaviors among Chinese construction workers in the context of climate change

Background: Workplace heat exposure can cause a series of heat-related illnesses and injuries. Protecting workers especially those undertake work outdoors from the risk of heat strain is a great challenge for many workplaces in China under the context of climate change. The aim of this study is to investigate the perceptions and adaptation behaviors of heat exposure among construction workers and to provide evidence for the development of targeted heat adaptation strategies nationally and internationally.

Methods: In 2020, we conducted a cross-sectional online questionnaire survey via WeChat Survey Star in China, using a purposive snowball sampling approach. A total of 326 construction workers submitted completed questionnaires. The perceptions of workplace heat exposure were measured using seven indicators: concerns over high temperature, perception of high temperature injury, attitudes towards both heat-related training and regulations, adjustment of working habits during heat, heat prevention measures in the workplace, and reduction of work efficiency. Bivariate and multivariate regression analyses were used to identify the factors significantly associated with workers' heat perceptions and behavioral responses. **Results:** 33.3% of the respondents were moderately or very concerned about heat exposure in the workplace. Less than half of the workers (43.8%) were worried about heat-related injuries. Workers who have either experienced work-related injuries (OR = 1.30, 95% CI 1.03-1.62) or witnessed injuries to others during high temperatures (OR = 1.12, 95% CI 1.02-1.27) were more concerned about heat exposure compared to other workers. Most respondents (63.5%) stated that their work efficiency declined during extremely hot weather. The factors significantly associated with a reduction of work efficiency included undertaking physically demanding jobs (OR = 1.28, 95% CI 1.07-1.54) and witnessing other workers' injuries during high temperatures (OR = 1.26, 95% CI 1.11-1.43). More than half of the workers were willing to adjust their work habits to adapt to the impact of high temperatures (81.6%). The internet was the most common method to obtain heat prevention information (44.7%), and the most frequently used heat prevention measure was the provision of cool drinking water (64.8%). **Conclusions:** Chinese construction workers lack heat risk awareness and are not well prepared for the likely increasing heat exposure in the workplace due to global warming. Therefore, there is a need to improve their awareness of heat-related injuries, strengthen high temperature related education and training, and update the current heat prevention policies to ensure compliance and implementation.

Han et al. 2022.

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

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

Keywords: Adaptation; Climate change; Health and safety; Heat exposure; Perception.

Evidence Level: 4B

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12231-4>

Exposures to IARC Carcinogenic Agents in work settings not traditionally associated with Sinonasal Cancer risk: The experience of the Italian National Sinonasal Cancer Registry

Background: The aim of this study is to highlight tasks and jobs not commonly considered at high risk for sinonasal cancer (SNC) identified by Regional Operating Centers currently active in the Italian National Sinonasal Cancer Registry (ReNaTuNS), which retrieve occupational histories through a standardized questionnaire. **Methods:** Data on exposures to IARC carcinogenic agents in work settings unknown to be associated with SNC risk were collected and analyzed. **Results:** Out of 2,208 SNC cases recorded in the ReNaTuNS database, 216 cases and their worked exposure periods were analyzed. Unsuspected jobs with exposure to wood dust include construction-related tasks, production of resins, agriculture and livestock jobs (straw and sawdust), and heel factory work (cork dust). Other examples are hairdressers, bakers (formaldehyde), dressmakers, technical assistants, wool and artificial fiber spinners, and upholsterers (textile dusts). Moreover, settings with coexposure to different agents (e.g., wood with leather dusts and chromium-nickel compounds) were recognized. The study describes jobs where the existence of carcinogenic agents associated with SNC risk is unexpected or not resulting among primary materials employed. **Conclusion:** The systematic epidemiological surveillance of all epithelial SNC cases with a

detailed collection of their work history, as performed by a dedicated population registry, is essential for detecting all potential occupational cases and should be considered in the context of forensic medicine and the compensation process.

Binazzi et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: Epidemiological surveillance; Occupational cancer; Occupational exposure; Sinonasal cancer.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/23/12593>

Sex and gender differences in occupational hazard exposures: A Scoping Review of the recent literature

Background: Comparative research on sex and/or gender differences in occupational hazard exposures is necessary for effective work injury and illness prevention strategies. This scoping review summarizes the peer-reviewed literature from 2009 to 2019 on exposure differences to occupational hazards between men and women, across occupations, and within the same occupation.

Recent findings: Fifty-eight studies retrieved from eight databases met our inclusion criteria. Of these, 30 studies were found on physical hazards, 38 studies on psychological/psychosocial hazards, 5 studies on biological hazards, and 17 studies on chemical hazards. The majority of studies reported that men were exposed to noise, vibration, medical radiation, physically demanding work, solar radiation, falls, biomechanical risks, chemical hazards, and blood contamination; while women were exposed to wet work, bullying and discrimination, work stress, and biological agents. Within the same occupations, men were more likely to be exposed to physical hazards, with the exception of women in health care occupations and exposure to prolonged standing. Women compared to men in the same occupations were more likely to experience harassment, while men compared to women in the same occupations reported higher work stress. Men reported more exposure to hazardous chemicals in the same occupations as women. The review suggests that men and women have different exposures to occupational hazards and that these differences are not solely due to a gendered distribution of the labor force by occupation. Findings may inform prevention efforts seeking to reduce gender inequalities in occupational health. Future research is needed to explain the reasons for sex/gender inequality differences in exposures within the same occupation.

Biswas et al. 2022.

Current Environmental Health Reports, vol. 27, no. 1-4.

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Keywords: Gender-based analysis; Occupational health; Safety; Scoping review; Sex differences; Workers.

Evidence Level: 6A

Link: <https://link.springer.com/article/10.1007%2Fs40572-021-00330-8>

Is Isocyanate exposure and occupational asthma still a major occupational health concern? Systematic Literature Review

Background: Isocyanate, whose disease-inducing mechanism is poorly understood, with poor prognosis, is widely used. Asthma is the most frequent manifestation of prolonged exposure. We assessed the evolution of the incidence of isocyanate-induced occupational asthma over time. **Methods:** PubMed and Cochrane databases were systematically searched for studies published since 1990 that assessed the relationship between occupational exposure to isocyanates and asthma. **Results:** We identified 39 studies: five retrospective cohort studies, seven prospective cohort studies, three of which were inception cohorts), seven observational cross-sectional studies, five literature reviews, two case series, and 13 registry studies. The incidence of occupational asthma secondary to isocyanate exposure has decreased from more than 5% in the early 1990s to 0.9% in 2017 in the United States. **Conclusion:** Despite the wide use of optimal collective and individual protection measures, the risk of occupational asthma has stabilized. Occupational asthma risk can be assessed with good sensitivity using self-questionnaires and pulmonary function tests. Occupational avoidance should be implemented as soon as possible after the first symptoms appear because the prognosis becomes increasingly poor with the persistence of exposure. It is now necessary to

study specifically cutaneous sensitization to isocyanates and to define what protective equipment is effective against this mode of exposure.

Coureau et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 24.

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Keywords: Isocyanates; Occupational asthma; Systematic review.

Evidence Level: 1A

Link: <https://www.mdpi.com/1660-4601/18/24/13181>

Occupational exposure to second-hand tobacco smoke: Development of a job exposure matrix

Background: Exposure to second-hand tobacco smoke (SHS) in the workplace has been largely controlled in most workplaces in many countries that have adopted smoke-free laws and regulations. Workers in offices, bars, restaurants, and many other settings have experienced substantial reductions in the frequency and intensity of their exposure to SHS. While current exposure to SHS of most non-smoking adults arises from living with a smoker there are likely to be some jobs where non-negligible exposure to SHS continues to occur. **Methods and Results:** This study describes the development of a simple job exposure matrix (JEM) for SHS exposure for the UK working population in 2020 and identifies that at least 1.04 million workers are likely to be exposed to SHS while performing their job. Occupations with the highest frequency and intensity of exposure include those where workers carry out work tasks in private, domestic settings: including care workers and home carers. **Conclusion:** This SHS-JEM provides a novel method for assessing occupational exposure to SHS in other countries, and can act as a tool to identify priorities for policies to protect those workers who continue to be at risk from SHS.

Dobson et al. 2022.

Annals of Work Exposure and Health, vol. 65, no. 9.

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Keywords: Aerosols; Exposure assessment; Exposure estimation; Occupational groups; Smoking.

Evidence Level: 6A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8675403/>

Sedentary Practices

Alternatives for measuring sitting accumulation in workplace surveys

Background: To develop and assess the measurement properties of self-report measures of accumulation of sitting time. **Methods:** Seven candidate measures were collected in 51 workers from three office environments (79% women) via online questionnaire administered immediately before and after 7-day monitoring periods (activPAL3 24-hour protocol with diary recorded work hours). **Results:** Three measures had some validity ($P < 0.05$ vs activPAL): % of sitting in long bouts more than or equal to 30 minutes, sitting strategy frequency (0 to 100), and interruption rate (n/h sitting). Agreement was limited. Some reliability (intraclass correlation or kappa $P < 0.05$) was seen for these measures, strategy variety (0 to 100), typical day (five categories), and making a conscious effort to sit less (yes/no). **Conclusions:** Two brief and one longer option may suit workplace studies requiring self-report measures of sitting accumulation. Validity was weaker for sitting accumulation than sitting time.

Clark et al. 2022.

Journal of Occupational and Environmental Medicine, vol. 63, no. 12.

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Keywords: Accumulation; Sitting time; Workplace surveys.

Evidence Level: 5A

Link:

https://journals.lww.com/joem/Fulltext/2021/12000/Alternatives_for_Measuring_Sitting_Accumulation_in.16.aspx

Effects of a workplace sit-stand desk intervention on health and productivity

Background: In Japan, standing while working has not yet become commonplace, and there is little evidence to support the benefits of standing during the workday. Therefore, this study assessed the relationship between the introduction of a sit-stand desk and its ability to reduce the negative effects of sitting too long and increase employees' general health and productivity. **Methods:** Seventy-four Japanese desk workers participated in this three-month intervention study. Using a randomized controlled trial, the participants were divided into intervention (n = 36) and control (n = 38) groups. The participant characteristics were ascertained using a questionnaire. The intervention effectiveness was assessed by measuring health-, physical activity-, and work-related outcomes. **Results:** The results indicate that the intervention group significantly decreased their sitting time at work (p = 0.002) and had reduced neck and shoulder pain (p = 0.001). There was a significant increase in subjective health (p = 0.002), vitality in work-related engagement (p < 0.001), and self-rated work performance over a four-week period (p = 0.017). **Conclusion:** These findings indicate a significant difference between the two groups, demonstrating the effectiveness of a sit-stand desk in reducing sedentary behavior and improving workers' health and productivity. Future research can accumulate further evidence of best practice use of sit-stand desks.

Ma et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 22.

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Keywords: Behavior change; Sedentary behavior; Sit–stand desk; Work productivity; Workplace intervention.

Evidence Level: 2B

Link: <https://www.mdpi.com/1660-4601/18/21/11604>

Musculoskeletal pain and sedentary behaviour in occupational and non-occupational settings: a systematic review with meta-analysis

Background: Sedentary behaviour (SB; time spent sitting) is associated with musculoskeletal pain (MSP) conditions; however, no prior systematic review has examined these associations according to SB domains. We synthesised evidence on occupational and non-occupational SB and MSP conditions. **Methods:** Guided by a PRISMA protocol, eight databases (MEDLINE, CINAHL, PsycINFO, Web of Science, Scopus, Cochrane Library, SPORTDiscus, and AMED) and three grey literature sources (Google Scholar, WorldChat, and Trove) were searched (January 1, 2000, to March 17, 2021) for original quantitative studies of adults ≥ 18 years. Clinical-condition studies were excluded. Studies' risk of bias was assessed using the QualSyst checklist. For meta-analyses, random effect inverse-variance pooled effect size was estimated; otherwise, best-evidence synthesis was used for narrative review. **Results:** Of 178 potentially-eligible studies, 79 were included [24 general population; 55 occupational (including 15 experimental/intervention)]; 56 studies were of high quality, with scores > 0.75. Data for 26 were meta-synthesised. For cross-sectional studies of non-occupational SB, meta-analysis showed full-day SB to be associated with low back pain [LBP - OR = 1.19(1.03 - 1.38)]. Narrative synthesis found full-day SB associations with knee pain, arthritis, and general MSP, but the evidence was insufficient on associations with neck/shoulder pain, hip pain, and upper extremities pain. Evidence of prospective associations of full-day SB with MSP conditions was insufficient. Also, there was insufficient evidence on both cross-sectional and prospective associations between leisure-time SB and MSP conditions. For occupational SB, cross-sectional studies meta-analysed indicated associations of self-reported workplace sitting with LBP [OR = 1.47(1.12 - 1.92)] and neck/shoulder pain [OR = 1.73(1.46 - 2.03)], but not with extremities pain [OR = 1.17(0.65 - 2.11)]. Best-evidence synthesis identified inconsistent findings on cross-sectional association and a probable negative prospective association of device-measured workplace sitting with LBP-intensity in tradespeople. There was cross-sectional evidence on the association of computer time with neck/shoulder pain, but insufficient evidence for LBP and general MSP. Experimental/intervention evidence indicated reduced LBP, neck/shoulder pain, and general MSP with reducing workplace sitting. **Conclusions:** We found cross-sectional associations of occupational and non-occupational SB with MSP conditions, with occupational SB associations being occupation dependent, however, reverse causality bias cannot be ruled out. While prospective evidence was inconclusive, reducing workplace sitting was associated with reduced MSP conditions. Future studies should emphasise prospective analyses and examining potential interactions with chronic diseases.

Dzakpasu et al. 2022.

International Journal of Behavioral Nutrition and Physical Activity, vol. 18, no. 1.

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Keywords: Computer time; Device-measured; Musculoskeletal pain (MSP) conditions; Non-occupational; Occupational; Sedentary behaviour (SB); Self-reported; Vehicle time; Workplace sitting.

Evidence Level: 1A

Link: <https://ijbnpa.biomedcentral.com/articles/10.1186/s12966-021-01191-y>

A systematic review and meta-analysis of the effect of treadmill desks on energy expenditure, sitting time and cardiometabolic health in adults

Background: As the health risks of sedentary working environments become more clear, greater emphasis on the implementation of walking interventions to reduce sitting time is needed. In this systematic review and meta-analysis, we investigate the role of treadmill-desk interventions on energy expenditure, sitting time, and cardiometabolic health in adults with sedentary occupations. **Methods:** Relevant studies published in English were identified using CINAHL, EMBASE, MEDLINE, Web of Science, Scopus, and PubMed databases up to December 2020. Random effects meta-analysis models were used to pool study results. **Results:** Thirteen relevant studies (six workplaces and seven laboratories) were found with a total of 351 participants. Pooled analysis of laboratory studies showed a significant increase in energy expenditure (105.23 kcal per hour, 95% confidence interval [CI]: 90.41 to 120.4), as well as metabolic rate (5.0 mL/kg/min, 95% CI: 3.35 to 6.64), among treadmill desk users compared to sitting conditions. No evidence of significant differences in blood pressure were found. In workplace studies, we observed a significant reduction in sitting time over a 24-h period (- 1.73 min per hour, 95% CI: - 3.3 to - 0.17) among users of treadmill desks, compared to a conventional desk. However, there were no evidence of statistically significant changes in other metabolic outcomes. **Conclusions:** Treadmill desks offer a feasible and effective intervention to increase energy expenditure and metabolic rate and reduce sitting time while performing work-related tasks. Future studies are needed to increase generalizability to different workplace settings and further evaluate their impact on cardiometabolic health.

Oye-Somefun et al. 2022.

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

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Keywords: Adult; Obesity; Office; Sedentary; Treadmill; Workstation; Meta-analysis.

Evidence Level: 1A

Link: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12094-9>

Physical Activity

Self-reported and device-measured physical activity in leisure time and at work and associations with cardiovascular events - A prospective study of the physical activity paradox

Background: The beneficial health effects of physical activity, in particular moderate-to-vigorous physical activity (MVPA), are well documented, but there is an ongoing scientific debate whether the domain matters, i.e., whether leisure time physical activity is beneficial and occupational physical activity is detrimental to health, referred to as the physical activity paradox. **Methods:** The present study, therefore, analyzed the association between self-reported and device-measured physical activity and cardiovascular events in both domains. A representative sample of 807 individuals was followed for 14.6 ± 1.1 years, in which 59 cardiovascular events occurred. **Results:** For self-reported data, Cox proportional hazard models showed no effect of physical activity in leisure and at work, while for device-measured MVPA, beneficial associations with total time spent in MVPA and occupational time spent in MVPA were found, but not for leisure time spent in MVPA. When accounting for both domains in the same model, the associations disappeared. **Conclusion:** These results indicate that it matters how physical activity is measured and that MVPA is beneficial for cardiovascular health, but the domain in which MVPA occurs does not seem to matter.

Kuster et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 22.

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Keywords: Attitude; Behavior; Cardiovascular disease; Cox proportional hazard ratio; Leisure time physical activity; Occupational physical activity; Prospective cohort study.

Evidence Level: 4A

Link: <https://www.mdpi.com/1660-4601/18/22/12214>

Musculoskeletal Health

Towards harmonisation of case definitions for eight work-related musculoskeletal disorders - an international multi-disciplinary Delphi study

Background: International consensus is needed on case definitions of work-related musculoskeletal disorders and diseases (MSDs) for use in epidemiological research. We aim to: 1) study what information is needed for the case definition of work-related low back pain (LBP), lumbosacral radicular syndrome (LRS), subacromial pain syndrome (SAPS), carpal tunnel syndrome (CTS), lateral and medial elbow tendinopathy, and knee and hip osteoarthritis, and to 2) seek consensus among occupational health professionals/researchers regarding the case definitions of these work-related MSDs. **Methods:** A two-round Delphi study was conducted with occupational health professionals/researchers from 24 countries. Definition of work-related MSDs were composed of a case definition with work exposures. Round 1 included 32 case definitions and round 2, 60 case definitions. After two rounds, consensus required 75% of the panellists to rate a case definition including work exposures ≥ 7 points on a 9-point rating scale (completely disagree/completely agree). **Results:** Fifty-eight panellists completed both rounds (response rate 90%). Forty-five (70%) panellists thought that for LBP a case definition can be based on symptoms only. Consensus was only reached for work-related medial elbow tendinopathy, while the lowest agreement was found for knee osteoarthritis. Where consensus was not reached, this was - except for LBP - related to physical examination and imaging rather than disagreement on key symptoms. **Conclusion:** Consensus on case definitions was reached only for work-related medial elbow tendinopathy. Epidemiological research would benefit from harmonized case definitions for all MSDs including imaging and physical examination for LRS, SAPS, CTS, lateral elbow tendinopathy and hip and knee osteoarthritis.

Tamminga et al. 2022.

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

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Keywords: Carpal tunnel syndrome; Epicondylitis; Hip osteoarthritis; Knee osteoarthritis; Lateral elbow tendinopathy; Low back pain; Lumbosacral radicular syndrome; Medial elbow tendinopathy; Occupational disease; Subacromial pain syndrome; Tennis elbow.

Evidence Level: 6A

Link: <https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/s12891-021-04871-9>

Manual handling of heavy loads and low back pain among different occupational groups: results of the 2018 BIBB/BAuA employment survey

Background: In Germany and other European countries, many occupations still involve manual handling of loads (MHL), an activity that puts the musculoskeletal system at risk of low back pain (LBP). This study aims to describe the current prevalence of MHL in different occupational groups stratified by gender in Germany, the association between MHL and LBP and the adjusted prevalence of LBP in different response categories of MHL. **Methods:** Data was collected in telephone interviews conducted as part of the 2018 BIBB/BAuA Employment Survey, which covers work-related topics like working conditions, education, health status and job satisfaction. The analyses were limited to full-time workers (> 35 h/week) aged between 15 and 67. The frequency of MHL was analysed descriptively. BLOSSFELD classification was used to group the participants in occupational categories. The analysis of the association between MHL and the prevalence of LBP over the last 12 months was based on robust log-linear Poisson regression that results in prevalence ratios (PR). The main regression model was adjusted for gender, age, working hours, and working conditions. Adjusted estimates for the prevalence of LBP were calculated based on regression

analysis. **Results:** The sample consists of $n = 14,331$ participants (men: $n = 8828$, 61.6%; women: $n = 5503$, 38.4%; median age 49 years). Of these, 52.8% say they were exposed to MHL at work. MHL is most common in agricultural occupations, skilled and unskilled occupations. In the regression model, participants who said they were "often" exposed to MHL reported more frequently LBP than those participants who said they were "never" exposed to MHL. The PR as estimate for the association is 1.41 (95%CI [1.32; 1.49]). Postestimation of the prevalence of LBP began with 47.3% (95%CI [43.8%; 51.1%]) for participants who said they were "never" exposed to MHL and rose to 66.5% (95%CI [62.4%; 71.0%]) for participants who indicated they were "often" exposed to MHL. **Conclusions:** The 2018 BIBB/BAuA Employment Survey emphasizes that MHL is still common in the German workforce and shows a significant association to LBP. Prevention policies for avoiding MHL remain vital.

Sauter et al. 2022.

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

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Keywords: BIBB/BAuA employment survey; Employment; Gender; prevalence; Health status; Musculoskeletal system; Occupations; Workforce; Working conditions.

Evidence Level: 5B

Link: <https://bmcmusculoskeletdisord.biomedcentral.com/articles/10.1186/s12891-021-04819-z>

Developing a practice and evidence-based guideline for occupational health and safety professionals to prevent and handle musculoskeletal pain in workplaces

Background: Practice guidelines can facilitate the translation of evidence-based knowledge into better occupational health and safety (OHS) prevention. **Methods:** This paper describes the development process, findings and content of a practice and evidence-based guideline for musculoskeletal pain (MSP) to OHS professionals in Denmark. We used a participatory process with involvement of more than 100 OHS professionals in the development of the guideline. **Results:** The guideline contains three sections: 1) Rapid review of risk factors for MSP (Push/pull, Screen work, Lifting, Awkward postures and Psychosocial factors related to MSP) and single- and multi-stranded interventions targeting MSP. 2) Process recommendations for use of the guideline by a three-phase participatory process 3) Practical recommendations that contain advice and methods for the three-phase participatory process. **Conclusion:** This paper can promote future guideline development, as it provides specific insight into how OHS professionals can be included in the development of practice and evidence-based guideline through a participatory process.

Schmidt et al. 2022.

Applied Ergonomics, vol. 97.

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Keywords: Guideline; Musculoskeletal pain; Occupational health and safety.

Evidence Level: 6B

Link: <https://www.sciencedirect.com/science/article/pii/S0003687021001678?via%3Dihub>

The effects of workplace interventions on low back pain in workers: A systematic review and meta-analysis

Background: This systematic review and meta-analysis aimed to analyze the effects of workplace interventions (WI) on clinical outcomes related to low back pain (LBP) in a worker population, and to assess socio-economic parameters as participants on sick leave, days of sick leave, and return to work following WI. **Methods:** A systematic literature search was performed to select randomized clinical trials that investigated the effectiveness of WI on return to work, sick leave, and working capacity of workers affected by nonspecific LBP. **Results:** Fourteen articles were included in the review and meta-analysis. The meta-analysis showed improvements in pain ($p = 0.004$), disability ($p = 0.0008$), fear-avoidance for physical activity ($p = 0.004$), and quality of life ($p = 0.001$ for physical scale and $p = 0.03$ for mental scale) for patients who underwent WI compared to controls. Moreover, the pain reduction following WI was statistically significant in the healthcare workers' group ($p = 0.005$), but not in the other workers' group. The participants on sick leave and the number of days of sick leave decreased in the WI group without statistical significance ($p = 0.85$ and $p = 0.10$, respectively). Finally, LBP recurrence was significantly reduced in the WI

group ($p = 0.006$). **Conclusion:** WI led to a significant improvement of clinical outcomes in a workers' population affected by LBP.

Russo et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: Low back pain; Meta-analysis; Systematic review; Work ability; Workers; Workplace interventions.

Evidence Level: 1A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8657220/>

Prevalence and risk factors associated with low back pain in the Saudi adult community: A cross-sectional study

Background: Worldwide, low back pain is common and linked with many risk factors. There is a lack of studies in the Saudi Arabian community on low back pain prevalence and risk factors. Therefore, the present research will investigate the prevalence of low back pain in the middle-aged and elderly community population and examine the risk factors contributing to low back pain in Saudi Arabia. **Methods:** The present paper is a cross-sectional study of the community living in Riyadh and the surrounding areas in Saudi Arabia. Data were collected between October 2019 and April 2020 via trained research assistants. A total of 276 participants were included in the analysis. **Results:** The prevalence of low back pain was 27.9% ($n = 77$) among the participants included in this study. All participants reported low back pain severity with a mean of 4.35 ± 2.19 on the pain rating scale. Older age, arthritis, hypertension, anemia, osteoporosis, and a history of fractures were all associated with having LBP. Low back pain is highly prevalent in the Saudi community adult population living in Riyadh and its surrounding areas. More than a fourth of the sample reported experiencing back pain. **Conclusion:** The study outlines several modifiable risk factors (BMI, education, employment status, marital status, and smoking status) and unmodifiable risk factors (arthritis, hypertension, anemia, osteoporosis, and a history of fractures) associated with low back pain in the study sample.

Alhowimel et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 24.

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Keywords: Community; Low back pain; Prevalence; Risk factors.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/18/24/13288>

Occupational risk factors for meniscal lesions: a systematic review and meta-analysis

Background: Meniscal lesions are common and are associated with the development of knee osteoarthritis. Knee-straining activities at work such as kneeling or squatting cause high biomechanical stresses on the knee joints that can lead to acute or chronic injuries. The objective of this systematic review is to update the evidence on the potential relationship between occupational risk factors and meniscal lesions.

Methods: We searched the Medline, Embase and Web of Science databases until August 2021 to identify epidemiological observational studies on the association between occupational risk factors and meniscal lesions. Study selection, data extraction and risk of bias assessment were performed independently by two reviewers. Effect measures were extracted from individual studies and pooled with random effects meta-analysis. Heterogeneity analyses were conducted. We used GRADE (Grades of Recommendations, Assessment, Development and Evaluation) to assess the overall quality of evidence. **Results:** The database search resulted in 11,006 references, and 46 additional studies were identified through hand search. Twenty-two studies (represented in 25 publications) met the predefined eligibility criteria and nine records were included in the meta-analysis. There was only one study with an overall low risk of bias. Significant associations between occupational risk factors and the development of meniscal lesions were found for kneeling (effect size (ES) 2.15, 95% CI 1.67-2.76), squatting (ES 2.01, 95% CI 1.34-3.03), climbing stairs (ES 2.28, 95% CI 1.58-3.30), lifting and carrying weights ≥ 10 kg (ES 1.63, 95% CI 1.35-1.96), lifting and carrying weights ≥ 25 kg (ES 1.56, 95% CI 1.08-2.24), playing football on a professional level (ES 5.22, 95% CI 3.24-8.41), working as a hard coal miner (ES 5.23, 95% CI 2.16-12.69) and floor layers (ES 1.99, 95% CI 1.43-2.78).

The overall quality of evidence according GRADE was moderate to low. **Conclusion:** We found consistent evidence of an increased risk of meniscal lesions by occupational knee-straining exposures. Our findings are important for the development of preventive strategies to reduce work-related knee disorders and work absence.

Bahns et al. 2022.

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

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Keywords: Meniscal lesion; Meniscus; Meta-analysis; Occupation; Systematic review; Work.

Evidence Level: 1A

Link: <https://bmcmusculoskeletaldisord.biomedcentral.com/articles/10.1186/s12891-021-04900-7>

Analysis of the effect of wearing extensible and non-extensible lumbar belts on biomechanical factors of the sit-to-stand movement and pain-related psychological factors affecting office workers with low back pain

Background: This study aimed to investigate the effects of wearing extensible and non-extensible lumbar belt (LB) on biomechanical factors of the sit-to-stand (STD) movement and pain-related psychological factors affecting office workers with low back pain. **Methods:** Among 30 office workers, 15 with low back pain (LBP) were assigned to the experimental group and 15 healthy adults were assigned to the control group. The participants performed STD movement in random order of three different conditions: without LB (Condition 1), with extensible LB (Condition 2), and with non-extensible LB (Condition 3). Biomechanical variables of STD movement in each condition were measured using a three-dimensional motion analysis system and force plate. Pain-related psychological factors were measured only in the experimental group.

Results: Among the biomechanical factors of STD movement, an interaction effect was found in the maximum anterior pelvic tilt angle and total-phase range of motion of the trunk ($p < 0.05$). Pain intensity, pain-related anxiety, and pain catastrophizing were decreased in the conditions with lumbar belts (Conditions 2 and 3) compared to the condition without LB (Condition 1) ($p < 0.05$). **Conclusion:** Extensible and non-extensible lumbar belts engender biomechanically beneficial effects during STD movement in both office workers with LBP and healthy office workers. Further, pain intensity, pain-related anxiety, and pain catastrophizing were decreased in office workers with LBP. Therefore, both types of extensible lumbar belts may be helpful in the daily life of patients with LBP and office workers.

Im et al. 2022.

Healthcare (Basel), vol. 9, no. 11.

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Keywords: Biomechanics; Low back pain; Lumbar belt; Pain-related psychology; Sit-to-stand.

Evidence Level: 3A

Link: <https://www.mdpi.com/2227-9032/9/11/1601>

COVID 19

Adapting to the Future of Work

COVID-19 passport as a factor determining the success of National Vaccination Campaigns: Does it work?

The case of Lithuania vs. Poland

Background: As the ongoing COVID-19 pandemic poses a global threat, it is of utmost importance that governments should find effective means of combating vaccine hesitancy and encouraging their citizens to vaccinate. **Methods:** In our article, we compare the vaccination outcomes in the past months in two neighbouring post-communist EU states, Lithuania and Poland. **Results:** Both introduced COVID-19 certificates, but only the former followed with gradual limitations for those who failed to get vaccinated, beginning with restricted access to restaurants, sports facilities and indoor events, and finally banning residents without a certificate from entering supermarkets or larger shops and using most services. By contrast, in Poland, the certificate remained a tool for international travel only. **Conclusion:** We show using statistical data that Lithuania's strict policy, regardless of its social implications, led to markedly higher vaccination outcomes in all age groups than those in Poland at the time.

Walkowiak et al. 2022.

Vaccines (Basel), vol. 9, no. 12.

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

Keywords: COVID-19; Interventions to increase vaccination coverage; Public health; Trust in vaccines; Vaccination; Vaccination coverage.

Evidence Level: 6B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8708167/>

The impact of enforced working from home on employee job satisfaction during COVID-19: An event system perspective

Background: During the COVID-19 pandemic, working from home (WFH) became the only option for many organizations, generating increasing interest in how such arrangements impact employee job satisfaction.

Methods: Adopting an event system perspective, this study employed an online survey to capture the WFH experiences of 256 workers from 66 Chinese enterprises during the pandemic. Using fuzzy-set qualitative comparative analysis (fsQCA), the study examined how satisfaction was affected by five job characteristics when working from home: longevity (time), home workspace suitability (space), job autonomy (criticality), digital social support (novelty) and monitoring mechanisms (disruption). **Results:** The findings reveal that three configurations promote employee job satisfaction and that a suitable home workspace is a core condition. **Conclusion:** In the absence of a suitable workspace, digital social support and an appropriate monitoring mechanism, long-term WFH was found to undermine job satisfaction. However, job autonomy is not a necessary condition for employee job satisfaction. These findings have clear implications for theory and practice.

Yu et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 24.

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Keywords: COVID-19 pandemic; Event system theory; fsQCA; Job characteristic; Job satisfaction; Working from home.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/24/13207>

Work-from/at/for-home: CoVID-19 and the future of work - A critical review

Background: The Covid19 pandemic has led to speculation about the place of offices in the future world of work - while working-from-home was initially mandated by employers (and governments), recent research has reported that the practice has gained popularity among employees. However, most such research is based on experiences of workers in the Global North. **Methods:** The article challenges the conflation of the Global North with global and shifts the focus from 'flexible working' and 'work-life balance' to issues of access to work infrastructures, including space, internet, and care. It draws upon existing scholarship on home-based work and precarious work, especially gig work, to outline ways to analyse the implications of working-from-home in diverse settings. **Results and Conclusion:** Illustrated with the story of Prachi, a young e-commerce worker in Delhi, the article offers work-from/at/for-home as a wider framework that accounts for inequalities in labour and life conditions of workers around the world.

Islam 2022.

Geoforum, vol. 128.

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

Keywords: Gender; Global south; India; Infrastructures; Space; Work-from-home.

Evidence Level: 6A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8608622/>

Increased work from home and low back pain among Japanese desk workers during the Coronavirus disease 2019 pandemic: A cross-sectional study

Background: To prevent the spread of coronavirus disease 2019 (COVID-19), desk workers in Japan have been encouraged to work from home. Due to rapidly increased working from home, working in environments that are not properly designed and working with poor posture can affect low back pain (LBP).

Methods: This study aimed to examine the relationship between increased work from home during the

COVID-19 pandemic and LBP among Japanese desk workers. Using study data from the Japan COVID-19 and Society Internet Survey 2020 conducted from August to September 2020, 4227 desk workers who did not have LBP before the COVID-19 pandemic were analyzed out of 25,482 total respondents. Odds ratios (ORs) and 95% confidence intervals (CIs) for LBP were calculated by multivariable logistic regression, adjusting for covariates such as socioeconomic factors. **Results:** During the COVID-19 pandemic, 31.3% of desk workers with an increased chance of working from home, and 4.1% had LBP. Desk workers with increased working from home were more likely to have LBP (OR: 2.00 (95% CI, 1.36-2.93)). **Conclusion:** In this large-scale study, increased work from home was associated with LBP among desk workers during the COVID-19 pandemic. Therefore, preparing an appropriate work environment for desk workers working from home can improve productivity, leading to positive effects.

Minoura et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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

Keywords: COVID-19; Internet survey; Japan; Cross-sectional study; Desk worker; Low back pain; Work from home.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/18/23/12363>

Precarious employment and health in the context of COVID-19: a rapid scoping umbrella review

Background: There are widespread concerns that workers in precarious employment have suffered the most in the COVID-19 pandemic and merit special attention. The aim of this rapid scoping umbrella review was to examine what evidence exists about how COVID-19 has affected the health of this highly vulnerable group, and what gaps remain to be investigated. **Methods:** Five databases were searched for systematic or scoping reviews from January 2020 to May 2021. The quality of the included reviews was determined using A MeaSurement Tool to Assess systematic Reviews. **Results:** We identified 6 reviews that reported 30 unique relevant primary studies. The included studies indicate that essential (non-health) workers are at greater risk of COVID-19 infection and case fatality than others in their surrounding community. The occupational risk of exposure to COVID-19 also seems to be greater among more precarious categories of workers, including younger workers and workers in low-income and low-skilled occupations. Further, hazardous working conditions faced by many essential workers appear to have amplified the pandemic, as several occupational sites became 'super-spreaders', due to an inability to socially distance at work and high contact rates among workers. Finally, employment and financial insecurity generated by the pandemic appears to be associated with negative mental health outcomes. The quality of the included reviews however, and their primary studies, were generally weak and many gaps remain in the evidence base.

Conclusions: Our study highlights that COVID-19 is creating new health risks for precarious workers as well as exacerbating the pre-existing health risks of precarious employment.

McNamara et al. 2022.

European Journal of Public Health, vol. 31.

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Keywords: COVID-19; Health; Precarious employment.

Evidence Level: 1A

Link: https://academic.oup.com/eurpub/article/31/Supplement_4/iv40/6423465

Work ethics, stay-at-home measures and COVID-19 diffusion: How is the pandemic affected by the way people perceive work?

Background: Non-pharmaceutical interventions aimed at reducing the spread of COVID-19 rely largely on voluntary compliance among the target population to be effective, since such measures, which are aimed at the entire population, are very hard to enforce. In this paper, we focus on the impact of different work ethics on the spread of COVID-19. There are indeed reasons to believe that populations with different attitudes toward work will react differently to stay-at-home orders and other policies that forbid people from working. **Methods:** By means of a quantitative analysis, using hybrid model estimators, we test the impact of different work ethics on COVID-19 diffusion in a sample of 30 European countries. **Results:**

Results show that the more a population holds certain beliefs about work—namely, that it is humiliating to receive money without working, that people who do not work become lazy, and that work always comes first—the higher contagion rates of COVID-19 are, *ceteris paribus*. On the other hand, the more a population perceives work as a social duty, the lower contagion rates are. **Conclusion:** All this suggests that different work ethics matter in the containment of COVID-19.

Alfano 2022.

The European Journal of Health Economics, vol. 6, no. 1-9.

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Keywords: COVID-19; Hybrid model; Non-pharmaceutical intervention; Work ethics.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007%2Fs10198-021-01402-0>

Cost of lost work hours associated with the COVID-19 pandemic—United States, March 2020 through February 2021

Background: Of the 22.8 million coronavirus disease 2019 (COVID-19) cases recorded in the United States as of March 21, 2021 with age information, three-fourths were in the working age group, indicating the potentially high economic impact of the pandemic. This study estimates the cost of lost work hours associated with the COVID-19 pandemic between March 2020 through February 2021. **Method:** I used a before-and-after analysis of data from the 2017–2021 Current Population Survey to estimate the costs of lost work hours due to economic, workers' own health, and other reasons, from the COVID-19 pandemic.

Results: Across March 2020 through February 2021 (a year since the start of the pandemic in the United States), the estimated cost of lost work hours associated with the COVID-19 pandemic among US full-time workers was \$138 billion (95% confidence interval [CI]: \$73.4 billion–\$202.46 billion). Shares of the costs attributed to economic, workers' own health, and other reasons were 33.7%, 13.7%, and 52.6%, respectively. **Conclusion:** The \$138 billion cost of lost work hours associated with the COVID-19 pandemic during March 2020 through February 2021 highlights the economic consequences of the pandemic, as well as indicating the potential benefit of public health and safety interventions used to mitigate COVID-19 spread.

Asfaw 2022.

American Journal of Industrial Medicine, vol. 65, no. 1.

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: COVID-19; CPS; Lost work hours.

Evidence Level: 5B

Link: <https://onlinelibrary.wiley.com/doi/10.1002/ajim.23307>

Home, sweet home? The impact of working from home on the division of unpaid work during the COVID-19 lockdown

Background: A lockdown implies a shift from the public to the private sphere, and from market to non-market production, thereby increasing the volume of unpaid work. Already before the pandemic, unpaid work was disproportionately borne by women. This paper studies the effect of working from home for pay (WFH), due to a lockdown, on the change in the division of housework and childcare within couple households. While previous studies on the effect of WFH on the reconciliation of work and family life and the division of labour within the household suffered from selection bias, we are able to identify this effect by drawing upon the shock of the first COVID-19 lockdown in Austria. The corresponding legal measures left little choice over WFH. In any case, WFH is exogenous, conditional on a small set of individual and household characteristics we control for. **Methods:** We employ data from a survey on the gendered aspects of the lockdown. The dataset includes detailed information on time use during the lockdown and on the quality and experience of WFH. Uniquely, this survey data also includes information on the division, and not only magnitude, of unpaid work within households. Austria is an interesting case in this respect as it is characterized by very conservative gender norms. **Results:** The results reveal that the probability of men taking on a larger share of housework increases if men are WFH alone or together with their female partner. By contrast, the involvement of men in childcare increased only in the event that the female

partner was not able to WFH. **Conclusion:** Overall, the burden of childcare, and particularly homeschooling, was disproportionately borne by women.

Derndorfer et al. 2022.

PLoS One, vol. 16, no. 11.

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Keywords: Working from home; Unpaid work; COVID-19.

Evidence Level: 6A

Link: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0259580>

Impact of working from home on cardiovascular health: An emerging issue with the COVID-19 pandemic

Background: Mandatory working from home is one of the consequences of the COVID-19 pandemic for a large number of workers. Transition to working from home may significantly impact lifestyle, psychosocial status, and the overall health of workers. **Methods:** This review summarizes available data about the effects of lockdown measures, particularly working from home, on cardiovascular risk factors including sedentary lifestyle, unhealthy diet pattern, psychological distress, smoking, alcohol misuse, and cardiometabolic parameters. **Results:** Finally, we suggest countermeasures that can attenuate the negative health impact of working from home. **Conclusion:** Indeed, timely and tailored interventions implemented by companies in cooperation with the health care system could allow workers to benefit more from some of the advantages associated with working from home.

Di Fusco et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 22.

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Keywords: COVID-19 pandemic; Cardiovascular disease; Diet pattern; Lifestyle; Physical activity; Sedentary behavior; Working from home.

Evidence Level: 6A

Link: <https://www.mdpi.com/1660-4601/18/22/11882>

Work from home during the COVID-19 pandemic: An observational study based on a large geo-tagged COVID-19 Twitter dataset (UsaGeoCov19)

Background: As COVID-19 swept over the world, people discussed facts, expressed opinions, and shared sentiments about the pandemic on social media. **Methods:** Since policies such as travel restriction and lockdown in reaction to COVID-19 were made at different levels of the society (e.g., schools and employers) and the government, we build a large geo-tagged Twitter dataset titled UsaGeoCov19 and perform an exploratory analysis by geographic location. **Results:** Specifically, we collect 650,563 unique geo-tagged tweets across the United States covering the date range from January 25 to May 10, 2020. Tweet locations enable us to conduct region-specific studies such as tweeting volumes and sentiment, sometimes in response to local regulations and reported COVID-19 cases. During this period, many people started working from home. The gap between workdays and weekends in hourly tweet volumes inspire us to propose algorithms to estimate work engagement during the COVID-19 crisis. **Conclusion:** This paper also summarizes themes and topics of tweets in our dataset using both social media exclusive tools (i.e., #hashtags, @mentions) and the latent Dirichlet allocation model. We welcome requests for data sharing and conversations for more insights.

Feng et al. 2022.

Information Process and Management, vol. 59, no. 2.

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

Keywords: Descriptive study; Lockdown; Reopen; Spatiotemporal analysis; Stay-at-home order; Work from home.

Evidence Level: 6B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8656435/>

Guiding and Supporting Mental Health and Wellbeing

To work or not to work, that is the question: The psychological impact of the first COVID-19 lockdown on the elderly, healthcare workers, and virtual workers

Background: The spread of COVID-19 created a state of emergency all over the world and played a big role in the decline of the mental health of citizens. The context of the workplace became an important variable in the impact of the lockdown on individuals. **Methods:** In this study, we deepened the categories of healthcare workers (HWs), virtual workers (VWs), and the elderly, along with their emotional approach to this emergency. A sample of 257 participants (ElderlyN = 62; HWsN = 104; VWsN = 91) completed: a semi-structured interview on their experience during lockdown via telephone; an online survey with a sociodemographic questionnaire; the Difficulties in Emotional Regulation Scale (DERS); and the Post-Traumatic Growth Inventory (PTGI). Linguistic measures of the Referential Process were utilized to code the interviews. An independent ANOVA explored the variability among groups. **Results:** The results show more affective language in the Elderly (M = 0.0310, SD = 0.0070) and a growth in spirituality (M = 4.16, SD = 3.17). HWs displayed a higher PTGI (M = 56.84, SD = 20.29), while VWs displayed a lower PTGI (M = 50.02, SD = 21.05). Moreover, VWs presented higher scores in Impulse on the DERS (M = 11.67, SD = 5.05) and a more cognitive/abstract narration (Reflection IREF M = 0.0260, SD = 0.0071; Reorganization IWRRL M = 0.5419, SD = 0.0032; Referential Activity IWRAD M = 0.4978, SD = 0.0029). **Conclusion:** This study aims to take the work context into consideration to create focused interventions.

Andreassi et al. 2022.

Healthcare (Basel, Switzerland), vol. 9, no. 12.

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Keywords: Coronavirus pandemic; Emotional regulation; Narratives; Post-traumatic growth; Referential activity.

Evidence Level: 5A

Link: <https://www.mdpi.com/2227-9032/9/12/1754>

Working from home and positive/negative experiences due to social distancing as interacting factors of depressive symptoms during the COVID-19 pandemic in a Chinese general population

Background: This study investigated the associations between some factors related to working from home status (WFHS) and positive/negative experiences due to social distancing and their interactions effects on depressive symptoms during the COVID-19 pandemic. **Methods:** A random population-based telephone survey interviewed income-earning adults in the Hong Kong general population during April 21-28, 2020 (n = 200). **Results:** Mild to severe depression (according to PHQ-9) was reported by 12% of the participants. The prevalence of WFHS categories was 14% for 3-7 days and 13% for ≥ 8 days (past 2 weeks). The multivariable regression analysis showed that, social isolation ($\beta = 0.36$; $p < 0.001$), relaxation feeling in daily life ($\beta = -0.22$; $p = 0.002$), and WFHS ≥ 8 days ($\beta = 0.15$; $p = 0.027$), but not perceived huge inconvenience and improved family relationship, were associated with depressive symptoms. Statistically significant interaction effects were found. Some positive experiences buffered the potential harms of some negative experiences of social distancing on depressive symptoms; WFHS ≥ 8 days significantly moderated the risk/protective effects of social isolation, improved family relationship, and relaxation feeling on depressive symptoms. **Conclusions:** Social distancing is double-edged. Positive experiences should be maximized while negative experiences be minimized, as both were directly and interactively associated with depression. Intensive but not mild to moderate ($< 80\%$) WFHS may impact depressive symptoms negatively via its direct association with depression; it also moderated the associations between positive/negative experiences due to social distancing and depression. Further research is required to discern the inter-relationships among WFHS, positive/negative experiences of social distancing, and depression to better cope with the stressful pandemic.

Yu et al. 2022.

Social Psychiatry and Psychiatric Epidemiology, vol. 2.

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Keywords: COVID-19; China; Depression; Interaction; Social distancing; Working from home.

Evidence Level: 5B

Link: <https://link.springer.com/article/10.1007%2Fs00127-021-02179-6>

A descriptive analysis of 2020 California Occupational Safety and Health Administration COVID-19-related complaints

Background: COVID-19 mortality has disproportionately affected specific occupations and industries. The Occupational Safety and Health Administration (OSHA) protects the health and safety of workers by setting and enforcing standards for working conditions. Workers may file OSHA complaints about unsafe conditions. Complaints may indicate poor workplace safety during the pandemic. **Methods:** We evaluated COVID-19-related complaints filed with California (Cal)/OSHA between January 1, 2020 and December 14, 2020 across seven industries. To assess whether workers in occupations with high COVID-19-related mortality were also most likely to file Cal/OSHA complaints, we compared industry-specific per-capita COVID-19 confirmed deaths from the California Department of Public Health with COVID-19-related complaints. **Results:** Although 7820 COVID-19-related complaints were deemed valid by Cal/OSHA, only 627 onsite inspections occurred, and 32 citations were issued. Agricultural workers had the highest per-capita COVID-19 death rates (402 per 100,000 workers) but were least represented among workplace complaints (44 per 100,000 workers). Health Care workers had the highest complaint rates (81 per 100,000 workers) but the second lowest COVID-19 death rate (81 per 100,000 workers). Industries with the highest inspection rates also had high COVID-19 mortality. **Conclusion:** Our findings suggest complaints are not proportional to COVID-19 risk. Instead, higher complaint rates may reflect worker groups with greater empowerment, resources, or capacity to advocate for better protections. This capacity to advocate for safe workplaces may account for relatively low mortality rates in potentially high-risk occupations. Future research should examine factors determining worker complaints and complaint systems to promote participation of those with the greatest need of protection.

Thomas et al. 2022.

SSM Population Health, vol. 17.

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Keywords: COVID-19; Health disparities; Occupational health; Worker protections.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S2352827321002913?via%3Dihub>

Job insecurity and emotional disturbance of Polish employees during pandemic COVID-19

Background: The pandemic, as an event that is new and dangerous to the health and life of the population, has put employees at risk of losing their job and experiencing deteriorating working and employment conditions. In this situation, authors were particularly concerned with the extent to which job insecurity (both quantitative and qualitative) contributed to the deterioration of workers' well-being.

Material and methods: The study was carried out on 382 Polish employees in April and May 2020. The following research tools were used: the *Job Insecurity in Pandemic Scale* by Chirkowska-Smolak and Czumak and the *Depression, Anxiety, Stress Scale* (DASS-21) by Levibond and Levibond. **Results:** The quantitative and qualitative job insecurity were significant predictors of depression and stress, but they did not explain anxiety symptoms. The scope of the explained variance of these negative emotional states by concerns related to work and employment was not large (from 11% to 17.6%). The moderating role of perceived employability was confirmed only in the case of the relationship between qualitative job insecurity and depression, as well as quantitative job insecurity and stress. However, the increase in the explained variance was very small. **Conclusions:** Uncertainty related to the maintenance of employment and concerns about the deterioration of working conditions due to the COVID-19 pandemic had an impact on emotional disturbances of employees, but they only explained some of the variance of depression and stress and did not affect the perceived level of anxiety. The smaller role of economic stress in the emergence of negative emotional states could be associated with the occurrence of much more serious threats to the health and life of the population in this period. The very low level of unemployment in Poland, which remained at a similar level throughout the pandemic despite the catastrophic forecasts of economists, could also have played an important role.

Chirkowska-Smolak et al. 2022.

Medycyna Pracy, vol. 72, no. 6.

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Keywords: COVID-19; Anxiety; Depression; Employability; Job insecurity; Stress.

Evidence Level: 5B

Link: <http://medpr.imp.lodz.pl/Job-insecurity-and-emotional-disturbance-of-Polish-employees-during-pandemic-COVID,143612,0,2.html>

Relationships between physical activity, work ability, absenteeism and presenteeism in Australian and New Zealand adults during COVID-19

Background: Public health movement and social restrictions imposed by the Australian and New Zealand governments in response to the COVID-19 pandemic influenced the working environment and may have affected health behaviours, work ability, and job performance. The aim of this study was to determine the associations between health behaviours and work ability and performance during COVID-19 restrictions and if health behaviours were related to demographic or population factors. **Methods:** A cross-sectional survey was used to gather responses from 433 adult employees in Australia and New Zealand between June and August 2020. The survey requested demographic information and used the International Physical Activity Questionnaire, Work Ability Index, and the World Health Organisation's Health and Work Performance Questionnaire. Multivariate regression models were used to explore relationships between the identified variables while controlling for several possible confounders. **Results:** Being sufficiently physically active was associated with higher reported physical (aOR = 2.1; $p = 0.001$) and mental work abilities (aOR = 1.8; $p = 0.007$) and self-reported job performance (i.e., lower presenteeism) (median +7.42%; $p = 0.03$). Part-time employees were 56% less likely ($p = 0.002$) to report a good or very good mental work ability. Those with existing medical conditions were 14% less likely ($p = 0.008$) to be sufficiently active and 80% less likely ($p = 0.002$) to report rather good or very good physical work ability. Being sufficiently active was associated with higher physical and mental work abilities and better job performance during the COVID-19 pandemic. **Conclusion:** Employers should support opportunities for regular physical activity and provide specific support to individuals with medical conditions or in part-time employment.

Hunter et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 23.

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Keywords: Coronavirus; Employee; Exercise; Health promotion; Physical activity; Productivity; Work ability.

Evidence Level: 4A

Link: <https://www.mdpi.com/1660-4601/18/23/12563>

Association between time spent with family and loneliness among Japanese workers during the COVID-19 pandemic: A cross-sectional study

Background: The current coronavirus (COVID-19) pandemic has had large impacts on society, including people practicing social distancing. This behavioral response has increased loneliness. Loneliness not only increases the risk of psychiatric disorders, but also affects occupational mental health. To avoid the negative effects of isolation, it is important to have social contact with other people, especially family members. Employment and economic instability caused by COVID-19 may have also affected family relationships. It is important to understand the association between family relationships and loneliness in workers under the pandemic. **Methods:** We collected usable data from 27,036 Japanese workers who completed an online survey during the COVID-19 pandemic. Participants were asked how long they spend with members of their family during mealtimes or at home, and if they experienced loneliness; the latter was assessed by a single question. Other questions included whether participants lived with their spouse, or with someone in need of care. To estimate the odds ratios (ORs) of time with family associated with loneliness we used a multilevel logistic model nested in the prefecture of residence, with adjustments for age, sex, marital status, presence of a cohabitant requiring care, equivalent income, educational level, number of employees in the workplace, frequency of remote work, availability of someone for casual chat, smoking, drinking, time for leisure interests, and cumulative rates of COVID-19 in the prefecture. **Results:** Ten percent (2,750) of the 27,036 participants reported loneliness. The survey showed

a significant negative correlation between time spent with family and loneliness ($p < 0.001$): participants who spent more time with family were less likely to feel loneliness. In addition, not living with a spouse and living with someone in need of care were associated with loneliness (not living with a spouse: $p < 0.001$; living with someone in need of care: $p < 0.001$). **Conclusion:** Loneliness under COVID-19 pandemic conditions was negatively associated with time spent with family members, with the converse result found for participants cohabiting with someone in need of care. These associations suggest the potential value of changes to working practices and interventions to combat loneliness.

Fujii et al. 2022.

Frontiers in Psychiatry, vol. 12.

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Keywords: COVID-19; Japan; Family; Loneliness; Workers.

Evidence Level: 4B

Link: <https://www.frontiersin.org/articles/10.3389/fpsyt.2021.786400/full>

Working at home: The impacts of COVID 19 on health, family-work-life conflict, gender, and parental responsibilities

Background: To examine the impact of working at home on general health, pain, stress, and work-family and family-work conflict, and differences based on gender and parental responsibilities. **Methods:** A convenience sample of 658 adults completed an online questionnaire. Regression modeling examined the effects and interactions of gender and parental responsibility on general health, musculoskeletal discomfort/pain frequency and severity, stress, and work-family and family-work conflict. **Results:** Women reported more pain and discomfort, regardless of the presence of children, than men with children. Women with children experienced increased stress compared with men with children. Women without children experienced less work-family conflict, and those without children experienced less family-work conflict than men with children. **Conclusions:** The impact on pain, stress, and work-family and family-work conflict, due to mandated working at home, is gendered and influenced by parental responsibilities.

Graham et al. 2022.

Journal of Occupational and Environmental Medicine, vol. 63, no. 11.

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Keywords: Working from home; COVID-19; Family; Gender; Parental responsibilities.

Evidence Level: 5A

Link:

https://journals.lww.com/joem/Fulltext/2021/11000/Working_at_Home_The_Impacts_of_COVID_19_on_5.aspx

Returning to the workplace during the COVID-19 pandemic: The concerns of Australian workers

Background: To determine the nature and prevalence of workers' concerns regarding workplaces reopening during the pandemic. To identify characteristics of workers and industries where particular concerns are more common. **Method:** Prospective cohort study of 1063 employed Australian adults, enrolled at the start of the pandemic. Data on attitudes to workplaces reopening were collected 1 July-30 September 2020. The frequency of concerns describes infection risk and changes to work and impact on home life. Regression models examined associations between demographic and industry factors with reopening concerns. **Results:** More than four in five (82.4%) of workers reported concerns about workplace infection risk. Just over half (53.4%) reported concerns about impacts to work and home life. Concerns were more prevalent for workers reporting psychological distress, financial stress, and among those exclusively working from home. Concerns regarding infection risk were common for workers in health care (IRR 1.16, 95% CI [1.01, 1.33]), retail (IRR 1.31, 95% CI [1.06, 1.61]), and accommodation/food service industries (IRR 1.25, 95% CI [1.01, 1.55]). Concerns regarding changes to work and home life were more common for female workers (IRR 1.24, 95% CI [1.07, 1.43]), and partners/spouses with dependent children (IRR 1.44, 95% CI [1.16, 1.79]). **Conclusion:** Concerns of COVID-19 infection in the workplace are common. Many workers are also concerned about changes to their work and home life. The prevalence of concerns is related to the nature of work and responsibilities at home. Actions that reduce risk of workplace

transmission, coupled with effective communication of infection controls, may alleviate worker concerns whilst recognising workers' family and social circumstances.

Griffiths et al. 2022.

Journal of Occupational Rehabilitation, vol. 31, no. 4.

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Keywords: COVID-19; Hygiene; Infection risk; Social distancing; Working from home.

Evidence Level: 4A

Link: <https://link.springer.com/article/10.1007%2Fs10926-021-09990-7>

Smart working and well-Being before and during the COVID-19 pandemic: A scoping review

Background: The purpose of this scoping review focused on the relationship between smart working, a conception of job centered on the flexibility and autonomy of the worker, and well-being/illness in an organizational context before and during COVID-19. **Methods:** The literature review, conducted using the PRISMA (Preferred Reporting Items for Systematic Review and Meta-Analysis for qualitative synthesis) method for qualitative synthesis, considered studies published from 2014 to 2020. **Results:** From the analyses conducted by three independent coders, three main areas of interest in the literature emerged: (1) smart working and work engagement, (2) smart working and technostress, and (3) mediators of the relationship between smart working and well-being. **Conclusion:** The review highlights the need for an organizational culture increasingly oriented towards agile working practices in conjunction with organizational support and training.

Marino et al. 2022.

European Journal of Investigation in Health, Psychology and Education, vol. 11, no. 4.

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Keywords: Scoping review; Smart working; Technostress; Well-being; Work engagement.

Evidence Level: 6A

Link: <https://www.mdpi.com/2254-9625/11/4/108>

Employees' work-related well-Being during COVID-19 pandemic: An integrated perspective of technology acceptance model and JD-R theory

Background: Employees' work-related well-being has become one of the most significant interests of researchers and organizations due to the COVID-19 pandemic. **Methods:** This study examines how job characteristics such as mental load and team support, and technology-related factors such as perceived ease of use, perceived usefulness, and technology acceptance, impact employees' work engagement as a dimension of work well-being. Data were collected through a sample of 610 academic employees from three Norwegian universities after COVID-19 restrictions were implemented. **Results:** The structural model estimation showed that mental load, perceived team support, and technology acceptance were significantly related to work engagement. It also showed that perceived usefulness, perceived ease of use, and mental load were significantly related to technology acceptance. Furthermore, the analysis showed that technology acceptance partially mediates the relationship between job characteristics and work engagement, and fully mediates the relationship between technology-related perceptions and work engagement. **Conclusion:** Building on the technology acceptance model (TAM) and job demands-resources (JD-R) theory, this study provides insights into the effects of job-related and technology-related factors on remote workers' well-being. By doing so, we contribute to the existing literature by demonstrating how remote working with the use of newly implemented technologies can be related to employees' well-being during a pandemic.

Shamsi et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 22.

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Keywords: COVID-19; Mental load; Perceived team support; Remote working; Technology acceptance; Well-being; Work engagement.

Evidence Level: 5B

Link: <https://www.mdpi.com/1660-4601/18/22/11888>

Influence of the COVID-19 lockdown on the physical and psychosocial well-being and work productivity of remote workers: Cross-sectional correlational study

Background: Lockdowns imposed during the COVID-19 pandemic have impacted the living and working habits of millions of people, with potentially important implications for their physical, mental, and social well-being. **Objective:** The primary objective of this study was to investigate the impact of the COVID-19 pandemic on remote workers who were not directly affected by COVID-19. **Methods:** This was a correlational cross-sectional study (with an additional qualitative component) of 184 remote workers surveyed during the first COVID-19 lockdown in the United Kingdom. Standard measures of mental health (Kessler-6 Distress Scale), productivity (Brief Instrument to Assess Workers' Productivity During a Working Day), and physical activity (International Physical Activity Questionnaire) were used, and respondents were further surveyed on changes to their dietary, exercise, smoking, drinking, and socialization habits to produce a well-being change index. **Results:** The results revealed associations between sedentary behavior and poorer mental health ($\tau b=0.14$) and between poorer mental health and low work productivity ($\tau b=-0.39$). However, both positive and negative lifestyle changes were reported; a self-reported increase in well-being (with respect to diet, exercise, smoking, alcohol consumption, and socialization) since the start of the pandemic was associated with both better mental health ($\tau b=-0.14$) and better work productivity ($\tau b=0.14$). Of note, among respondents without a mental health diagnosis (137/184, 74.4%), we observed rates of moderate (76/137, 55.5%) and severe (17/137, 12.4%) psychological distress, which were markedly higher than those reported in large prepandemic studies; moreover, 70.1% (129/184) of our respondents reported more sedentary behavior, 41% (69/168) increased their alcohol consumption, and 38.6% (71/184) increased their overall food intake. However, 46% (75/163), 44.8% (39/87) and 51.8% (57/110) of respondents reported spending more time walking and engaging in more moderate and vigorous exercise, respectively. Qualitative analysis revealed many positive adaptations to lockdowns (eg, decreased commuting expenses, flexibility) but also a number of structural obstacles to remote working (eg, lack of support and high expectations from employers, childcare duties). **Conclusions:** These findings may be of practical importance for policy makers and employers in a world in which work involves long-term remote or hybrid employment arrangements; strategies to promote more sustainable remote working are discussed.

Tronco Hernández et al. 2022.

JMIRx Med, vol. 2, no. 4.

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Keywords: COVID-19; Employment; Health policy; Mental health; Pandemic; Policymakers; Remote workers; Wellbeing.

Evidence Level: 4B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8641476/>

A nationwide evaluation of the prevalence of and risk factors associated with anxiety, depression and insomnia symptoms during the return-to-work period of coronavirus disease 2019 in China

Background: To evaluate the prevalence of and risk factors associated with anxiety, depression, and insomnia symptoms during the return-to-work period of coronavirus disease 2019 in China. **Methods:** The authors conducted a large-scale, nationwide, multicenter, cross-sectional study in China. A population-based quota and snowball sampling were designed to recruit a representative sample. Online questionnaires and telephone reviews were used to collect characteristics and assess psychological and sleep problems. Anxiety, depression, and insomnia symptoms were measured by the generalized anxiety disorder-7, patient health questionnaire-9, and insomnia severity index tools. **Results:** A total of 42,000 participants were recruited from 15 centers, and 36,795 valid questionnaires were received. Generally, 18.3, 14.9, and 17.9% of the participants had anxiety, depression, and insomnia symptoms, respectively, and 2.2-2.7% had severe symptoms. Engaging in outside activity once in ≥ 30 days (OR = 2.719, OR = 2.074, OR = 2.225) and age 50-64 years (OR = 2.431, OR = 1.936, OR = 2.036) were common risk factors for anxiety, depression and insomnia symptoms. Living in Hubei Province (OR = 1.304, OR = 1.242) was a common risk factor for anxiety and insomnia symptoms. Working as frontline medical staff (OR = 2.150) was another risk factor for anxiety symptoms. The health education rate of the samples reached 98.9%. However, the psychological intervention rate was only 16.2%, and 2.5% received targeted interventions.

Conclusions: An increasing number of people might have psychological and sleep problems. However, the current psychological interventions are not sufficient. Efforts should be made to strengthen interventions for high-risk populations.

Wang et al. 2022.

Social Psychiatry and Psychiatric Epidemiology, vol. 56, no. 12.

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Keywords: Anxiety; Coronavirus disease 2019; Cross-sectional; Depression; Insomnia.

Evidence Level: 4B

Link: <https://link.springer.com/article/10.1007%2Fs00127-021-02046-4>

Enabling Healthy and Safe Workplaces

Occupational health protection for health workers during the coronavirus disease 2019 (COVID-19) pandemic: 6P-approach in China

Background: Health workers (HW) are on the frontline fighting against the COVID-19 pandemic, they are exposed to multiple occupational hazards. **Methods:** This article analyzed the comprehensive measures of protecting HWs during the COVID-19 response in China. **Results:** Occupational health protection of HWs was one of the key strategies of the public health measures adopted against the COVID-19 outbreak from the earliest stage in China. This prioritization of HWs health protection was based on the technical and policy guidance of WHO and International Labor Organization as well as the experiences from previous outbreaks in China. The comprehensive measures in China can be summarized as '6P-approach': public health emergency response, prompt learning from lessons, proactive measures of occupational health, precaution strategies against occupational hazards, personal protective equipment and medical devices supply, and professional networking. Through this 6P-approach, China was able to minimize the incidence of COVID-19 infection among HWs, while successfully containing the outbreak during the first quarter of 2020. Although the COVID-19 vaccines have been rolled out, however, the COVID-19 pandemic is still under rapidly evolving situation. **Conclusion:** Experiences from China may provide other countries with an example of prioritizing and incorporating occupational health protection of HWs in their public health measures responding to the COVID-19 pandemic.

Zhang et al. 2022.

Global Health Journal, vol. 5, no. 4.

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

Keywords: China; Coronavirus disease 2019 (COVID-19); Health workers; Occupational health protection.

Evidence Level: 6B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8613932/>

COVID-19 immunisation, willingness to be vaccinated and vaccination strategies to improve vaccine uptake in Australia

Background: The COVID-19 vaccine rollout is crucial to lifting community and economic restrictions.

Methods: This cross-sectional study aimed to assess: (a) COVID-19 vaccine uptake and associated factors; (b) COVID-19 vaccine intentions and associated factors; (c) community support for COVID-19 vaccination strategies and associated factors. The survey was conducted between May and July 2021 in Australia.

Results: Of 3003 participants, 30% reported they were already vaccinated and 39% indicated they would get vaccinated. Low socioeconomic and education levels, non-English speaking backgrounds and being parents were associated with decreased vaccine willingness and/or vaccination rates. High levels of support for vaccination strategies were demonstrated with mandatory vaccination being less preferable.

Respondents from non-English speaking backgrounds were more likely to support a mandatory vaccination policy. Respondents with the highest socioeconomic level were more likely to support vaccination requirements for international travel, visiting nursing homes and working in healthcare settings.

Respondents who were aged ≥ 70 years were more likely to support all proposed vaccination strategies.

Conclusion: Targeted campaigns should be implemented for parents and those who live in socioeconomic disadvantaged areas and have lower educational attainment. Concise and clear vaccine information should

be provided in lay and multiple languages to improve vaccine confidence. Vaccine enforcement policies should be considered and implemented with caution.

Wang et al. 2022.

Vaccines (Basel), vol. 9, no. 12.

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Keywords: COVID-19 vaccines; Vaccine intention; Vaccine policies; Vaccine uptake.

Evidence Level: 5A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8704895/>

Working from home during the COVID-19 crisis: How self-control strategies elucidate employees' job performance

Background: Employees around the globe experience manifold challenges to maintain job performance during the so-called work-from-home experiment caused by the COVID-19 crisis. Whereas the self-control literature suggests that higher trait self-control should enable employees to deal with these demands more effectively, we know little about the underlying mechanisms. **Methods:** In a mixed-methods approach and two waves of data collection, we examine how self-control strategies elucidate the link between teleworking employees' trait self-control and their job performance. Using a qualitative approach, we explored which strategies employees use to telework effectively (N = 266). **Results:** In line with the process model of self-control, reported strategies pertained to situation modification (i.e., altering the physical, somatic, or social conditions) and cognitive change (i.e., goal setting, planning/scheduling, and autonomous motivation). Subsequent preregistered, quantitative analyses with a diverse sample of 106 teleworkers corroborated that higher trait self-control is related to job performance beyond situational demands and prior performance. Among all self-control strategies, modifying somatic conditions and autonomous motivation was significantly associated with job performance and mediated the self-control-performance link. **Conclusion:** This research provides novel insights into the processes by which employees productively work from home and inspires a broad(er) view on the topic of self-control at work.

Troll et al. 2022.

Applied Psychology, vol. 4.

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Keywords: COVID-19; Process model; Self-control strategies; Telework; Trait self-control.

Evidence Level: 5B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8653060/>

Time to a negative SARS-CoV-2 PCR predicts delayed return to work after medical leave in COVID-19 infected health care workers

Background: To investigate whether HCWs return to work (RTW) after COVID-19 was associated with time to a negative viral detection test. **Methods:** To evaluate the association of RTW with an undetectable RT-PCR adjusting for different factors. **Results:** Three hundred seventy-five HCWs who required medical leave for COVID-19 at a hospital in Madrid. Multivariable analyses confirmed the association of delayed RTW with interval to negative PCR (OR_{adj} 1.12, 95% CI 1.08, 1.17) as well as age, sex, and nursing staff and clinical support services compared to physicians. A predictive model based on those variables is proposed, which had an area under the receiver operating curve of 0.82. **Conclusions:** Delayed RTW was associated with longer interval to a negative RT-PCR after symptom onset, adjusting for occupational category, age, and sex.

Villarreal et al. 2022.

Journal of Occupational and Environmental Medicine, vol. 63, no. 11.

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Keywords: SARS-CoV-2; PCR; Return to work; Medical leave; COVID-19; Health care.

Evidence Level: 5A

Link:

https://journals.lww.com/joem/Fulltext/2021/11000/Time_to_a_Negative_SARS_CoV_2_PCR_Predicts_Delayed.10.aspx

Impact of Governmental interventions on epidemic progression and workplace activity during the COVID-19 outbreak

Background: In the first quarter of 2020, the COVID-19 pandemic brought the world to a state of paralysis. During this period, humanity saw by far the largest organized travel restrictions and unprecedented efforts and global coordination to contain the spread of the SARS-CoV-2 virus. **Methods:** Using large scale human mobility and fine grained epidemic incidence data, we develop a framework to understand and quantify the effectiveness of the interventions implemented by various countries to control epidemic growth. **Results and Conclusion:** Our analysis reveals the importance of timing and implementation of strategic policy in controlling the epidemic. We also unearth significant spatial diffusion of the epidemic before and during the lockdown measures in several countries, casting doubt on the effectiveness or on the implementation quality of the proposed Governmental policies.

Ram et al. 2022.

Scientific Reports, vol. 11, no. 1.

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Keywords: Epidemic; Workplace activity; Government interventions; COVID-19.

Evidence Level: 5B

Link: <https://www.nature.com/articles/s41598-021-01276-5>

Motivation for COVID-19 vaccination in priority occupational groups: A cross-sectional survey

Background: Due to the limited availability of COVID-19 vaccines, occupational groups with priority access were identified prior to vaccination. The study aimed to analyze motives for vaccination in these occupational groups. **Methods:** Members of occupational groups, who were vaccinated at the vaccination center of University Hospital Olomouc before 30 April 2021, were asked to fill in an online questionnaire. **Results:** A total of 3224 completed questionnaires were obtained from 1332 healthcare workers, 1257 school employees, 363 social service workers, 210 security force members, and 62 critical infrastructure workers. The most frequent motive for vaccination was the effort to protect family members (76.2%), the effort to prevent the spread of COVID-19 in one's profession (72.3%), followed by concerns about COVID-19 itself (49.1%) and exemptions from anti-epidemic measures (36.8%). Only for social services, the motive focused on one's profession was mentioned more often (75.2%) than the motive focused on the family (71.1%). At the level of detailed profession-oriented motives, a collegial effort of security force members to protect co-workers and not to endanger the workplace was dominant. **Conclusions:** The effort to prevent the spread of COVID-19 in the professional environment is a strong motive for vaccination, and strongest among social service workers.

Štěpánek et al. 2022.

International Journal of Environmental Research and Public Health, vol. 18, no. 21.

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Keywords: COVID-19; Motive; Occupational group; Security forces; Social service; Vaccination.

Evidence Level: 4B

Link: <https://www.mdpi.com/1660-4601/18/21/11726>

Psychosocial and behavioral outcomes and transmission prevention behaviors: Working during the Coronavirus disease 2019 pandemic

Background: To investigate the impact of coronavirus disease 2019 (COVID-19) on psychosocial and behavioral responses of the non-health care workforce and to evaluate transmission prevention behavior implementation in the workplace. **Participants and methods:** We deployed the baseline questionnaire of a prospective online survey from November 20, 2020, through February 8, 2021 to US-based employees. The survey included questions on psychosocial and behavioral responses in addition to transmission prevention behaviors (e.g., mask wearing). Select questions asked employees to report perceptions and behaviors before and during the COVID-19 pandemic. Data were analyzed descriptively and stratified by work from home (WFH) percentage. **Results:** In total, 3607 employees from 8 companies completed the survey. Most participants (70.0%) averaged 90% or more of their time WFH during the pandemic. Employees reported increases in stress (54.0%), anxiety (57.4%), fatigue (51.6%), feeling unsafe (50.4%), lack of companionship

(60.5%), and feeling isolated from others (69.3%) from before to during the pandemic. Productivity was perceived to decrease for 42.9% of employees and non-work-related screen time and alcohol consumption to increase for 50.7% and 25.1% of employees, respectively, from before to during the pandemic. Adverse changes were worse among those with lower WFH percentages. Most employees reported wearing a mask (98.2%), washing hands regularly (95.7%), and physically distancing (93.6%) in the workplace.

Conclusion: These results suggest worsened psychosocial and behavioral outcomes from before to during the COVID-19 pandemic and higher transmission prevention behavior implementation among non-health care employees. These observations provide novel insight into how the COVID-19 pandemic has impacted non-health care employees.

Senerat et al. 2022.

Mayo Clinic Proceedings – Innovations, Quality and Outcomes, vol. 5, no. 6.

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Keywords: CAPTURE; CARDIA; COVID-19, Coronavirus disease 2019; ECHO; SARS-CoV-2, Severe acute respiratory syndrome coronavirus 2; SMW, Stand and Move at Work; WFH, Work from home.

Evidence Level: 4B

Link: [https://www.mcpiqjournal.org/article/S2542-4548\(21\)00133-8/fulltext](https://www.mcpiqjournal.org/article/S2542-4548(21)00133-8/fulltext)

Exposure to a SARS-CoV-2 infection at work: development of an international job exposure matrix (COVID-19-JEM)

Background: This study aimed to construct a job exposure matrix (JEM) for risk of becoming infected with the SARS-CoV-2 virus in an occupational setting. **Methods:** Experts in occupational epidemiology from three European countries (Denmark, The Netherlands and the United Kingdom) defined the relevant exposure and workplace characteristics with regard to possible exposure to the SARS-CoV-2 virus. In an iterative process, experts rated the different dimensions of the COVID-19-JEM for each job title within the International Standard Classification of Occupations system 2008 (ISCO-08). Agreement scores, weighted kappas, and variances were estimated. **Results:** The COVID-19-JEM contains four determinants of transmission risk [number of people, nature of contacts, contaminated workspaces and location (indoors or outdoors)], two mitigation measures (social distancing and face covering), and two factors for precarious work (income insecurity and proportion of migrants). Agreement scores ranged from 0.27 [95% confidence interval (CI) 0.25-0.29] for 'migrants' to 0.76 (95% CI 0.74-0.78) for 'nature of contacts'. Weighted kappas indicated moderate-to-good agreement for all dimensions [ranging from 0.60 (95% CI 0.60-0.60) for 'face covering' to 0.80 (95% CI 0.80-0.80) for 'contaminated workspaces'], except for 'migrants' (0.14 (95% CI -0.07-0.36)). As country differences remained after several consensus exercises, the COVID-19-JEM also has a country-axis. **Conclusions:** The COVID-19-JEM assesses the risk at population level using eight dimensions related to SARS-COV-2 infections at work and will improve our ability to investigate work-related risk factors in epidemiological studies. The dimensions of the COVID-19-JEM could also be valuable for other future communicable diseases in the workplace.

Oude Hengel et al. 2022.

Scandinavian Journal of Work, Environment and Health, vol. 48, no. 1.

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Keywords: Job exposure matrix; SARS-CoV-2; COVID; Risk.

Evidence Level: 6B

Link: <https://www.sjweh.fi/article/3998>

Working at home and alcohol use

Background: 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.

Methods: 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. **Results:** 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. **Conclusion:** 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. 2022.

Addictive Behaviors Reports, vol. 14.

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

Evidence Level: 4B

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

Responses to offense at work and the impact of hierarchical status: The fault of the leader, causal attributions, and social support during the Covid-19 pandemic crisis

Background: The study explores the mechanism by which unadapted causal attributions and the perception of social support stimulate revenge and reconciliation at the social and professional level in the context of the current pandemic. In particular, the purpose of the study is to investigate the relationship between the accused, the victim and offender status and the search for revenge or reconciliation following a personal offense. **Methods:** To test the suggested research model, we analyzed the data collected by 167 ($m = 28.52$; $SD = 8.98$) employees in different organizations using a multifactorial experimental design.

Results: The results support the influence of attributional predictions in forming revenge and reconciliation and show that they are involved in the decision to carry out revenge, but especially in the way the employee interprets the trigger situation. In conclusion, the revenge is based on a negative attributional mechanism that produces the greatest deficit of adaptation to the situation and a weakening of the perception of social support, while reconciliation seems to be based on a much more complex socio-occupational mechanism. **Conclusion:** Leaders should pay attention to organizational communication during a crisis as they could encourage hopelessness depression. Adjusting crisis communication is crucial to ensuring job satisfaction that could mitigate negative effects.

Marian et al. 2022.

Frontiers in Psychology, vol. 12.

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Keywords: Attributional style; Emotions; Reconciliation; Revenge; Social support.

Evidence Level: 5B

Link: <https://www.frontiersin.org/articles/10.3389/fpsyg.2021.734703/full>

The impact of COVID-19 critical illness on new disability, functional outcomes and return to work at 6 months: a prospective cohort study

Background: There are few reports of new functional impairment following critical illness from COVID-19. We aimed to describe the incidence of death or new disability, functional impairment and changes in health-related quality of life of patients after COVID-19 critical illness at 6 months. **Methods:** In a nationally representative, multicenter, prospective cohort study of COVID-19 critical illness, we determined the prevalence of death or new disability at 6 months, the primary outcome. We measured mortality, new disability and return to work with changes in the World Health Organization Disability Assessment Schedule 2.0 12L (WHODAS) and health status with the EQ5D-5LTM. **Results:** Of 274 eligible patients, 212 were enrolled from 30 hospitals. The median age was 61 (51-70) years, and 124 (58.5%) patients were male. At 6 months, 43/160 (26.9%) patients died and 42/108 (38.9%) responding survivors reported new disability. Compared to pre-illness, the WHODAS percentage score worsened (mean difference (MD), 10.40% [95% CI 7.06-13.77]; $p < 0.001$). Thirteen (11.4%) survivors had not returned to work due to poor health. There was a decrease in the EQ-5D-5LTM utility score (MD, - 0.19 [- 0.28 to - 0.10]; $p < 0.001$). At 6 months, 82 of 115 (71.3%) patients reported persistent symptoms. The independent predictors of death or new disability were higher severity of illness and increased frailty. **Conclusions:** At six months after COVID-19 critical illness, death and new disability was substantial. Over a third of survivors had new disability, which was widespread across all areas of functioning.

Hodgson et al. 2022.

Critical Care, vol. 25, no. 1.

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

Keywords: COVID-19; Disability; Intensive care; Long-term outcome; Mechanical ventilation.

Evidence Level: 4A

Link: <https://ccforum.biomedcentral.com/articles/10.1186/s13054-021-03794-0>

Vulnerability of construction workers during COVID-19: Tracking welfare responses and challenges

Background and Methods: This paper takes stock of the cash assistance provided by the government to construction workers during the COVID-19 pandemic. As the role of the state construction welfare board has been crucial, some existing issues related to boards and challenges emerged during the crisis have also been discussed. **Results:** Results show that cash benefit through direct benefit transfer has partially helped workers to overcome their financial distress, but 65% workers did not receive any benefit due to various issues related to registration and seeding of bank accounts with Aadhar. Sluggish process of registration has been a major issue which is being addressed by different mechanisms, but results would be known later. Proper cess collection and its utilisation is still an important issue as 61% of the cess collected in 2019 was not utilised. Even during the crisis, 15% cess was used at most in direct benefit transfer and in-kind (food distribution) support. Majority of the states are running a number of welfare schemes, but the coverage is poor despite proper guidelines set under the Model Welfare Framework of the Ministry of Labour and Employment. The objectives of Mission Mode Projects are appreciable, but the outcomes are not known even after the completion of deadlines. **Conclusion:** Above all, the emerging issues of maintaining health and hygiene at worksite and living place and getting vaccinated are major challenges for the sustainability of the construction sector. Hence, a collective effort of the government, employers, and workers' organisations is the need of the hour.

Jha et al. 2022.

The Indian Journal of Labour Economics, vol. 1, no. 1-25.

User License: *PMC Open Access Subset*

Keywords: COVID-19; Construction; Direct benefit transfer; Migration; Workers.

Evidence Level: 6B

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8559686/>

Safety and immunogenicity of inactivated SARS-CoV-2 vaccine in high-risk occupational population: a randomized, parallel, controlled clinical trial

Background: Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection and the resulting coronavirus disease 2019 (COVID-19) have a substantial burden on health-care systems around the world. This is a randomized parallel controlled trial for assessment of the immunogenicity and safety of an inactivated SARS-CoV-2 vaccine, aiming to determine an appropriate vaccination interval of the vaccine for high-risk occupational population. **Methods:** In an ongoing randomized, parallel, controlled phase IV trial between January and May 2021 in Taiyuan City, Shanxi Province, China, we randomly assigned the airport ground staff and public security officers aged 18 to 59 years to receive two doses of inactivated SARS-CoV-2 vaccine at 14 days, 21 days, or 28 days. The serum neutralizing antibody to live SARS-CoV-2 was performed at baseline and 28 days after immunization. Long-term data are being collected. The primary immunogenicity endpoints were neutralization antibody seroconversion and geometric mean titer (GMT) at 28 days after the second dose. Analysis of variance (ANOVA), chi-square, and logistic regression analysis were used for data analysis. **Results:** A total of 809 participants underwent randomization and received two doses of injections: 270, 270, 269 in the 0-14, 0-21, and 0-28 vaccination group, respectively. By day 28 after the second injection, SARS-CoV-2 neutralizing antibody of GMT was 98.4 (95% CI: 88.4-108.4) in the 0-14 group, which was significantly lower compared with 134.4 (95% CI: 123.1-145.7) in the 0-21 group ($P < 0.001$ vs 0-14 group) and 145.5 (95% CI: 131.3-159.6) in the 0-28 group ($P < 0.001$ vs 0-14 group), resulting in the seroconversion rates to neutralizing antibodies (GMT ≥ 16) of 100.0% for all three groups, respectively. The intention-to-treat (ITT) analysis yielded similar results. All reported adverse reactions were mild. **Conclusions:** Both a two-dose of inactivated SARS-CoV-2 vaccine at 0-21 days and 0-28 days regimens significantly improved SARS-CoV-2 neutralizing antibody level compared to the 0-14 days regimen in high-risk occupational population, with seroconversion rates of 100.0%.

Feng et al. 2022.

Infectious Diseases of Poverty, vol. 10, no. 1.

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Keywords: COVID-19; High-risk occupational population; Immunogenicity; Inactivated SARS-CoV-2 vaccine; Randomized controlled trial; Safety.

Evidence Level: 2A

Link: <https://idpjournals.biomedcentral.com/articles/10.1186/s40249-021-00924-2>

A rapid review of the use of face mask in preventing the spread of COVID-19

Background: The original use of face masks was to help protect surgical wounds from staff-generated nasal and oral bacteria. Currently governments across the world have instituted the mandatory use of masks and other face coverings so that face masks now find much broader usage in situations where close contact of people is frequent and inevitable, particularly inside public transport facilities, shopping malls and workplaces in response to the COVID-19. **Objective:** We conducted a rapid review to investigate the impact face mask use has had in controlling transmission of respiratory viral infections. **Method:** A rapid review was conducted in line with Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidance. Five electronic databases (CINAHL, Embase, Medline, PsycINFO and Global Health) were searched from database inception to date, using pre-defined search terms. We included all studies of any design and used descriptive analysis to report summary statistics of search results. Data were extracted including sample characteristics, study design, respiratory virus being controlled, type of face masks used and their effectiveness. **Results:** 58 out of 84 studies met the inclusion criteria, of which 13 were classified as systematic reviews and 45 were quantitative studies (comprising randomised controlled trials, retrospective cohort studies, case control, cross-sectional, surveys, observational and descriptive studies). $N = 27$ studies were conducted amongst healthcare workers wearing face masks, $n = 19$ studies among the general population, $n = 9$ studies among healthcare workers the general population and patients wearing masks, and $n = 3$ among only patients. Face masks use have shown a great potential for preventing respiratory virus transmission including COVID-19. **Conclusion:** Regardless of the type, setting, or who wears the face mask, it serves primarily a dual preventive purpose; protecting oneself from getting viral infection and protecting others. Therefore, if everyone wears a face mask in public, it offers a double barrier against COVID-19 transmission.

Abboah-Offei et al. 2022.

International Journal of Nursing Studies Advances, vol. 3.

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

Keywords: COVID-19; Face mask; Pandemic; Prevention; Rapid review; Respiratory viral infection.

Evidence Level: 6A

Link: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7718106/>

Health and safety risk perceptions and needs of app-based drivers during COVID-19

Background: App-based drivers face work disruptions and infection risk during a pandemic due to the nature of their work, interactions with the public, and lack of workplace protections. Limited occupational health research has focused on their experiences. **Methods:** We surveyed 100 app-based drivers in Seattle, WA to assess risk perceptions, supports, and controls received from the company that employs them, sources of trust, stress, job satisfaction, COVID-19 infection status, and how the pandemic had changed their work hours. Data were summarized descriptively and with simple regression models. We complemented this with qualitative interviews to better understand controls and policies enacted during COVID-19, and barriers and facilitators to their implementation. **Results:** Drivers expressed very high levels of concern for exposure and infection (86%-97% were "very concerned" for all scenarios). Only 31% of drivers reported receiving an appropriate mask from the company for which they drive. Stress (assessed via PSS-4) was significantly higher in drivers who reported having had COVID-19, and also significantly higher in respondents with lower reported job satisfaction. Informants frequently identified supports such as unemployment benefits and peer outreach among the driver community as ways to ensure that drivers could access available benefits during COVID-19. **Conclusions:** App-based drivers received few protections from the company that employed them, and had high fear of exposure and infection at work. There is

increased need for health-supportive policies and protections for app-based drivers. The most effective occupational and public health regulations would cover employees who may not have a traditional employer-employee relationship.

Bechman et al. 2022.

American Journal of Industrial Medicine, vol. 64, no. 11.

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Keywords: COVID-19; App-based drivers; Gig economy; Vulnerable workers; Worker stress.

Evidence Level: 5B

Link: <https://onlinelibrary.wiley.com/doi/10.1002/ajim.23295>

The effect of eye protection on SARS-CoV-2 transmission: a systematic review

Background: The effect of eye protection to prevent SARS-CoV-2 infection in the real-world remains uncertain. We aimed to synthesize all available research on the potential impact of eye protection on transmission of SARS-CoV-2. **Methods:** We searched PROSPERO, PubMed, Embase, The Cochrane Library for clinical trials and comparative observational studies in CENTRAL, and Europe PMC for pre-prints. We included studies that reported sufficient data to estimate the effect of any form of eye protection including face shields and variants, goggles, and glasses, on subsequent confirmed infection with SARS-CoV-2.

Results: We screened 898 articles and included 6 reports of 5 observational studies from 4 countries (USA, India, Columbia, and United Kingdom) that tested face shields, goggles, and wraparound eyewear on 7567 healthcare workers. The three before-and-after and one retrospective cohort studies showed statistically significant and substantial reductions in SARS-CoV-2 infections favouring eye protection with odds ratios ranging from 0.04 to 0.6, corresponding to relative risk reductions of 96% to 40%. These reductions were not explained by changes in the community rates. However, the one case-control study reported odds ratio favouring no eye protection (OR 1.7, 95% CI 0.99, 3.0). The high heterogeneity between studies precluded any meaningful meta-analysis. None of the studies adjusted for potential confounders such as other protective behaviours, thus increasing the risk of bias, and decreasing the certainty of evidence to very low.

Conclusions: Current studies suggest that eye protection may play a role in prevention of SARS-CoV-2 infection in healthcare workers. However, robust comparative trials are needed to clearly determine effectiveness of eye protections and wearability issues in both healthcare and general populations.

Byambasuren et al. 2022.

Antimicrobial Resistance and Infection Control, vol. 10, no. 1.

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Keywords: COVID-19; Eye protection; Face shield; Infection prevention; SARS-CoV-2.

Evidence Level: 1A

Link: <https://aricjournal.biomedcentral.com/articles/10.1186/s13756-021-01025-3>

Overview of legal measures for managing workplace COVID-19 infection risk in several Asia-Pacific countries

Background: Despite the lack of official COVID-19 statistics, various workplaces and occupations have been at the center of COVID-19 outbreaks. We aimed to compare legal measures and governance established for managing COVID-19 infection risks at workplaces in nine Asia and Pacific countries and to recommend key administrative measures. **Methods:** We collected information on legal measures and governance from both general citizens and workers regarding infection risks such as COVID-19 from industrial hygiene professionals in nine countries (Indonesia, India, Japan, Malaysia, New Zealand, Republic of the Philippines, Republic of Korea, Taiwan, and Thailand) using a structured questionnaire. **Results:** A governmental body overseeing public health and welfare was in charge of containing the spread and occurrence of infectious diseases under an infectious disease control and prevention act or another special act, although the name of the pertinent organizations and legislation vary among countries. Unlike in the case of other traditional hazards, there have been no specific articles or clauses describing the means of mitigating virus risk in the workplace that are legally required of employers, making it difficult to define the responsibilities of the employer. Each country maintains own legal systems regarding access to the duration, administration, and financing of paid sick leave. Many workers may not have access to paid sick leave even if it is legally

guaranteed. **Conclusion:** Specific legal measures to manage infectious disease risks, such as providing proper personal protective equipment, education, engineering control measures, and paid sick leave are recommended to be stipulated in Industrial safety and health-related acts.

Derek et al. 2022.

Safety and Health at Work, vol. 12, no. 4.

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Keywords: ANOH(Asian Network of Occupational Hygiene); COVID-19; Infectious disease risk; Personal protective equipment.

Evidence Level: 6A

Link: <https://www.sciencedirect.com/science/article/pii/S2093791121000755?via%3Dihub>

U.S. frontline workers and COVID-19 inequities

Background: We overcome a lack of frontline worker status information in most COVID-19 data repositories to document the extent to which occupation has contributed to COVID-19 disparities in the United States. **Methods:** Using national data from over a million U.S. respondents to a Facebook-Carnegie Mellon University survey administered from September 2020 to March 2021, we estimated the likelihoods of frontline workers, compared to non-frontline workers, 1) to ever test positive for SARs-Cov-2 and 2) to test positive for SARs-Cov-2 within the past two weeks. **Results:** Net of other covariates including education level, county-level political environment, and rural residence, both healthcare and non-healthcare frontline workers had higher odds of having ever tested positive for SARs-Cov-2 across the study time period. Similarly, non-healthcare frontline workers were more likely to test positive in the previous 14 days. Conversely, healthcare frontline workers were less likely to have recently tested positive. Our findings suggest that occupational exposure has played an independent role in the uneven spread of the virus. In particular, non-healthcare frontline workers have experienced sustained higher risk of testing positive for SARs-Cov-2 compared to non-frontline workers. **Conclusion:** Alongside more worker protections, future COVID-19 and other highly infectious disease response strategies must be augmented by a more robust recognition of the role that structural factors, such as the highly stratified U.S. occupational landscape, have played in the uneven toll of the COVID-19 pandemic.

Do et al. 2022.

Preventative Medicine, vol. 153.

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Keywords: Covid-19; Disparity; Frontline workers; Occupation.

Evidence Level: 5B

Link: <https://www.sciencedirect.com/science/article/pii/S0091743521004023?via%3Dihub>

The impact of ubiquitous face masks and filtering face piece application during rest, work and exercise on gas exchange, pulmonary function and physical performance: A Systematic Review with Meta-analysis

Background: Protection against airborne infection is currently, due to the COVID-19-associated restrictions, ubiquitously applied during public transport use, work and leisure time. Increased carbon dioxide re-inhalation and breathing resistance may result thereof and, in turn, may negatively impact metabolism and performance. **Objectives:** To deduce the impact of the surgical mask and filtering face piece type 2 (FFP2) or N95 respirator application on gas exchange (pulse-derived oxygen saturation (SpO₂), carbon dioxide partial pressure (PCO₂), carbon dioxide exhalation (VCO₂) and oxygen uptake (VO₂)), pulmonary function (respiratory rate and ventilation) and physical performance (heart rate HR, peak power output W_{peak}). **Methods:** Systematic review with meta-analysis. Literature available in Medline/Pubmed, the Cochrane Library and the Web of Knowledge with the last search on the 6th of May 2021. Eligibility criteria: Randomised controlled parallel group or crossover trials (RCT), full-text availability, comparison of the acute effects of ≥ 1 intervention (surgical mask or FFP2/N95 application) to a control/comparator condition (i.e. no mask wearing). Participants were required to be healthy humans and > 16 years of age without conditions or illnesses influencing pulmonary function or metabolism. Risk of bias was rated using the crossover extension of the Cochrane risk of bias assessment tool II. Standardised mean differences (SMD, Hedges' g) with 95% confidence intervals (CI) were calculated, overall and for subgroups based on mask

and exercise type, as pooled effect size estimators in our random-effects meta-analysis. **Results:** Of the 1499 records retrieved, 14 RCTs (all crossover trials, high risk of bias) with 25 independent intervention arms (effect sizes per outcome) on 246 participants were included. Masks led to a decrease in SpO₂ during vigorous intensity exercise (6 effect sizes; SMD = - 0.40 [95% CI: - 0.70, - 0.09], mostly attributed to FFP2/N95) and to a SpO₂-increase during rest (5 effect sizes; SMD = 0.34 [95% CI: 0.04, 0.64]); no general effect of mask wearing on SpO₂ occurred (21 effect sizes, SMD = 0.34 [95% CI: 0.04, 0.64]). Wearing a mask led to a general oxygen uptake decrease (5 effect sizes, SMD = - 0.44 [95% CI: - 0.75, - 0.14]), to slower respiratory rates (15 effect sizes, SMD = - 0.25 [95% CI: - 0.44, - 0.06]) and to a decreased ventilation (11 effect sizes, SMD = - 0.43 [95% CI: - 0.74, - 0.12]). Heart rate (25 effect sizes; SMD = 0.05 [95% CI: - 0.09, 0.19]), W_{peak} (9 effect sizes; SMD = - 0.12 [95% CI: - 0.39, 0.15]), PCO₂ (11 effect sizes; SMD = 0.07 [95% CI: - 0.14, 0.29]) and VCO₂ (4 effect sizes, SMD = - 0.30 [95% CI: - 0.71, 0.10]) were not different to the control, either in total or dependent on mask type or physical activity status. **Conclusion:** The number of crossover-RCT studies was low and the designs displayed a high risk of bias. The within-mask- and -intensity-homogeneous effects on gas exchange kinetics indicated larger detrimental effects during exhausting physical activities. Pulse-derived oxygen saturation was increased during rest when a mask was applied, whereas wearing a mask during exhausting exercise led to decreased oxygen saturation. Breathing frequency and ventilation adaptations were not related to exercise intensity. FFP2/N95 and, to a lesser extent, surgical mask application negatively impacted the capacity for gas exchange and pulmonary function but not the peak physical performance.

Engeroff et al. 2022.

Sports Medicine - Open, vol. 7, no. 1.

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Keywords: Corona; Crisis; Dead space; Droplets; Sport; Upper airway infection.

Evidence Level: 1A

Link: <https://sportsmedicine-open.springeropen.com/articles/10.1186/s40798-021-00388-6>